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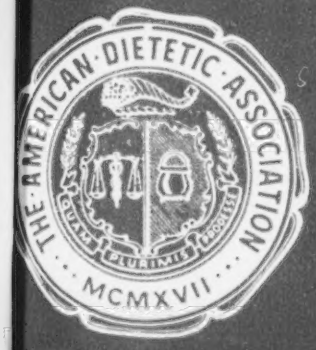

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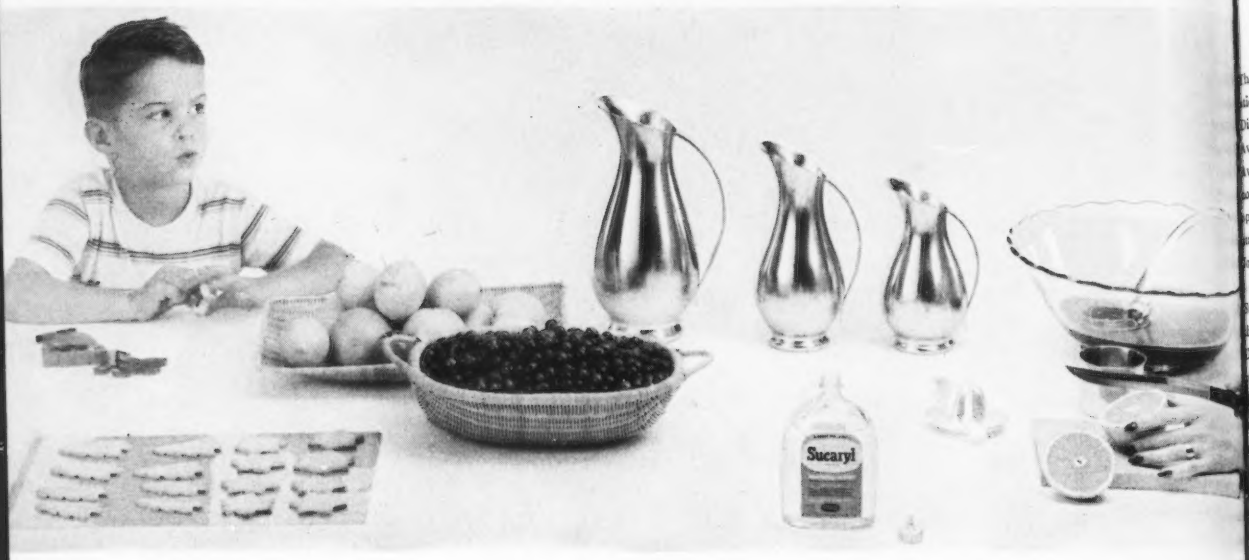

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A psychologist who has had an opportunity to work with dietitians and their helpers comments on some of the basic problems in interpersonal relations in dieteties.

Menus and Motives[1]

JOHN J. BROWNFAIN, Ph.D.

Chief, Psychology Service, Veterans Administration Hospital, Dearborn, Michigan

THIS title, "Menus and Motives," I discover, means rather different things to different people. I tried it out on a few people in the field of dietetics. One person anticipated a discussion on motivating unwilling patients to eat. Someone else decided that I would discuss the psychology of food preferences, why some people like their eggs sunny-side up and some like them soft boiled. Still another expected me to talk about the relationship between the emotions and the functioning of the digestive tract. There was the same kind of varied expectations among my psychological colleagues. A sampling of their reactions included such choice items as: "Why, undoubtedly, you're going to tell them about the relationship between a fondness for rare meat and the cannibalistic urge in the infant to eat his mother." Or, "No doubt you're going to give an account of your own personal research on the relative merits of the martini and the manhattan as a tonic to the appetite."

The fact is: I'm not going to talk about any of these things. At the time I so casually composed the title, I was pleased to reflect that I had come upon two words which are of such central importance in their different ways to both dietitians and psychologists, and which at the same time fell so pleasantly on the ear. I did not realize that the title would mean so many different things to different people. Yet now I am pleased that this is so. It serves to remind us in how many different and significant ways psychology is, and needs to be, intertwined with dietetics.

One set of meanings concerns what we might call the "psychology of food." Under such a heading, we might consider such problems as the development of food preferences, the effect of various foods on emotional states, the relationship between food preferences and a great number of personality variables, and so on. I have heard it said that we eat an emotional atmosphere along with our food, and it would be fascinating just to explore the implications of this statement. These are the psychologic problems which center about the reactions to food itself.

As complex as these problems are, we enlarge them enormously as soon as we begin to consider the interpersonal factors which so clearly center about the selection, preparation, serving, and ingestion of food, in both healthy and sick people. As soon as we realize that food is perceived, appreciated, rejected, throughout all of our lives in interpersonal terms, then we must switch our focus from food itself to the interpersonal factors in the dietitian's work. This is the other set of meanings implied by my topic.

As valuable as it might be, I do not intend to recite for you the principles and theories of interpersonal relations. I think I can do better than this. Some time ago I had the good fortune to meet with a group of dietitians at the Dearborn Veterans Administration Hospital to discuss with them in roundtable fashion whatever happened to be close to their hearts in the area of human relations. We met about ten times, each time for an hour-and-half. I learned a great deal from these discussions, and it is this experience that I want to share with you. In these meetings, people talked about what they had to talk about, and this was the first instructive thing. Their talk was not about calories or salaries. It was about people and about the everyday business of getting along with them. Interestingly enough, while no one denied the prime importance of good relationships with patients, they were rather satisfied that they had good relations with patients. Altogether, at Dearborn the customer is content. Problems seemed to focus around relations with staff—supervisors, supervisees, colleagues, nurses, physicians, supply people, clerks, and so on. If this is so at Dearborn, then I assume it is true everywhere. Indeed, I feel confident that as I relate my observations of the Dearborn group, you will recognize your own experience, for I shall speak of the human problems in getting a job done which exist wherever human beings come together to work.

As problems were presented and discussed, I was impressed by the fact that what looked on the sur-

[1] Presented before the Michigan Dietetic Association in Detroit, on April 19, 1956.

face like so many different and complex problems could actually be reduced to a few fundamental problems dealing with motives and interpersonal relations. For me, these fundamental problems were clarified and understandable in terms of certain basic concepts which come from my background in clinical and social psychology, and which have principally to do with interpersonal relations.

Definitions

I think it better to try to define these terms, "motives" and "interpersonal relations," before we look at the concepts which developed out of our group discussions. Motives themselves refer to patterns of needs and wishes and emotions and appetites—those forces which move us to seek satisfactions and to avoid dissatisfactions. Motives may be conscious. One generally knows when one is hungry, or angry, or in love. Motives may be unconscious. One generally does not know that one is over-dependent on others, jealous of the success of others, or overly ambitious. To understand human behavior, one must look for motives—and particularly for those which are social or interpersonal in nature.

Now we come to the term "interpersonal relations" or, according to an older usage, "human relations." Interpersonal relations is the preferable term, though I sometimes use the other. Essentially it defines itself. Interpersonal relations are what the term says—the relations between and among people. People cannot be understood as units in themselves. If you want to know what people are about, you must understand them in interpersonal terms—in the way they affect other people, and in the way they are affected by others. What we call personality itself can be understood only in interpersonal terms—for in a very real way our personality is a summing up of all the significant relationships we have ever had with people.

Transference

Now, let's return to those concepts that we dealt with in our group. I would like to introduce first the concept of transference. I place this number one because it was the concept which, more than any other, helped us to understand troubling and persistent difficulties in the relationships between people. Transference describes the tendency people have to react to novel situations in terms of behavior and feelings learned in old situations, and to do this without being aware of it. If the situation is really like the old one, then it is often possible to handle it with familiar ease. But the greater the difference between the new and old situations, the more inappropriate the old behavior might be.

Here is an example. Young and relatively inexperienced dietitians often have trouble giving directions to persons older than they are, and who have usually had years of experience in food preparation. The relation with an older woman reactivates a whole complex of buried feelings about the mother, and to some extent the new relationship will be influenced by this old one. You might put it this way: the relationship with the mother becomes the model for relations with all older women. If it was a happy relationship, perhaps there will be no conflict, but if there were feelings of rebellion, distrust, and rejection in the mother-daughter relation, then it is easy to understand how the new work relationship will be contaminated by them. The behavior of the older employee may be explained in the same way. She may find it hard to accept directions from someone who is frequently young enough to be her daughter. If she was a woman with a powerful need to control her daughter, then understandably she will have difficulty in adjusting to a reversal of roles.

Transference reactions govern the behavior of all people. Inevitably, and for good or ill, early experience determines later experience. The child is the father of the man. But this concept is worth mentioning in connection with the interpersonal problems of dietitians because there are aspects of transference which are likely to be exaggerated in special ways.

Consider the fact that it is women who are involved and that their common task is the preparation of food. This so clearly involves the transfer of activities and relationships from the old situation of the kitchen and the home to the new one of the institutional setting. What is more natural than that attitudes and emotions which had their origin in the family should be transferred to the new setting? Think of another aspect of transference. The man who works in the dietary department is usually supervised by a woman. If this man still happens to be convinced about the innate superiority of his sex, if brooding in his unconscious is the notion that boys who help their mothers in the kitchen are sissies, then there is likely to be a smoldering rebellion against the woman supervisor.

Transference takes on an infinite variety of guises, and I have done no more than try to illustrate its operation. It is a valuable concept because it makes such good sense out of behavior that otherwise appears to be quite irrational. If you ever find yourself disliking someone for no apparent reason—and who does not?—then try to understand your feelings in terms of this transference concept. There's a good chance you'll make sense of your reaction, and that is a valuable thing to happen. Once you make sense of yourself, you are equipped to deal with your problem in appropriate ways. Of course, simply calling something "transference" is not enough to solve a problem. You must obviously do more. But, calling something by its right name is a necessary first step.

Scapegoating

Now let us take a look at another concept rather related to transference which comes from the field of social psychology. We call this concept "scape-

goating." In scapegoating we find that blame and anger which stem from frustrating and unsatisfactory conditions are attributed to some source other than the real one. In our group discussions we talked a number of times about a special morale problem involving the employees assigned to the dishwashing machine. When we applied the concept of scapegoating to this problem, we began to solve it.

Operating the dishwashing machine was a job that people resisted doing. Why? Essentially because it had the lowest status of any job in the dietary department. Resentment at having to operate the dishwashing machine frequently resulted in innocent, but you may be sure, motivated breakage of crockery. Why? Well, the dishwashing machine and the dishwashing task were being made to bear the brunt of many irritations and disappointments that belonged elsewhere. It was almost as though the machine were turned into a person who then could be conveniently blamed and detested. To understand why the poor dishwashing machine becomes the object of this unreasonable behavior, think again of the concept of transference. Dishwashing in the home situation is one of the lowly jobs; we all try to get out of doing it; it's the function of the kitchen which seems likely to fall first victim to automation. Therefore, it becomes the victim of any stray feelings of anger, no matter where they might originate; it becomes the scapegoat.

Dissatisfaction with food by patients is in most cases an expression of scapegoating. Almost anything else might be at fault, but food is blamed. It amounts to a human foible, like complaining about the weather. We all complain, but who expects to do anything about it. And complainers about food generally don't expect anything to be done about it. Transference is also involved here. When we were children, eating was often the arena of our struggle with our parents. If they didn't love us, or at least, we thought they didn't, we'd "get back" at them by picking at food and complaining about it. It is helpful to realize that a complaint about food might really be a complaint about something quite personal. Knowing that this is so sends us searching for true causes. On the other hand, we mustn't think that all complaints about food are a matter of scapegoating. A *few* complaints, yes—scapegoating! *Many* complaints, then it would be well to sample the food!

Pecking Order

There is a concept from animal psychology that ties in closely with scapegoating, and in the group discussions, it was often enlightening to apply it to some of the problems. I refer to the concept of the "pecking order." People are very much like barnyard fowl when it comes to establishing a hierarchy of status, of determining who is top rooster and who is the little chick on the bottom. Even if the differences aren't real, that doesn't stop us from inventing them. It seems that people just must feel superior to someone.

Thus we see that jobs very quickly become ranked according to status, imagined or real. Usually pay determines job status, but not always. For example, at Dearborn, waitresses regularly attached to the medical staff dining room tended to "lord it over" those doing exactly the same work for the same pay in the attendants' dining room. Here is an excellent illustration of a pecking order derived from the ghostly substance of identifying oneself with a symbol of power, of extracting the most out of reflected glory. A morale problem naturally resulted. We all like to feel superior to someone, but no one likes to feel inferior to anyone.

This was a problem easily solved, once it was understood. The device called rotation came to the rescue. Rotation is, in many ways, the handmaiden of democracy. It solved the waitress problem, and it helped out on the dishwashing problem as well. The dishwashing problem was further alleviated when the supervisors from time to time would pitch in and help out on the machine. This is a nice illustration of the identification process working in a positive, problem-solving way. It becomes difficult to scapegoat an object that can be associated with a symbol of status. Let the supervisor show that no job is beneath contempt for her, and then no job is beneath contempt for anyone.

Noblesse Oblige

This suggests a concept for which I do not have a convenient psychologic term, but for which there does exist, nevertheless, a familiar and very appropriate phrase—*noblesse oblige*. Freely translated, it means that those in high places are obliged to be noble—and to be noble, one must also be humble. The higher one's place in the—let us say—pecking order, the more noble one is obliged to be, for the higher one's place, the more power one has for good and evil. I think this was demonstrated in the account of how the dishwashing machine gained respectability.

But there are other ways to illustrate *noblesse oblige*. Do supervisors know what a devastating effect it can have on their workers when they forget to say, "Good morning"? One of our group expressed it this way. "When Miss X doesn't say, 'good morning' to me or smile, I don't mind. We do the same work and I know we're friends. I just say to myself she got out of bed on the wrong side, or she's having boy friend trouble again. But when Miss Double X doesn't say, 'good morning,' then I really feel upset. It makes me wonder what I did wrong. It makes me uncomfortable about approaching her. I suppose she gets out of bed on the wrong side, too, but I'm not really convinced, and I blame myself." Miss Double X has much more power and influence than she knows, and much of this is expressed in ways that she never

realizes. After all, since we live in a democracy, she does have as much right to get out of bed on the wrong side as anyone, but she is obliged not to show it. She is obliged to be noble, to be aware of how much the well-being of other people depends on her good humor and courtesy.

Personality Obstacles

Now I find myself leaving behind the more formal psychologic concepts—though I certainly haven't exhausted them—to speak about those aspects of personality which are obstacles to effective interpersonal relations. Let us mention first the sin of pride. This is, as you know, one of the seven deadly sins. In human relations, it might be the deadliest of all. Pride keeps people stiff-necked, unwilling to acknowledge a fault and to try a new solution.

Yet pride is not what it seems to be. It is not boldness, or simple superiority, or arrogance. It is more likely a cover-up for insecurity. It is the unhappy way so many of us have of covering up our shaky self-esteem, our way of deceiving ourselves that we are right and virtuous and others are bad and wrong. Because we doubt our adequacy, we confuse the problem at issue with our personality. Our deep but unconscious thought goes like this: "If I admit I'm wrong on this, if I backtrack, then this will be proof to everyone that I'm not a competent person, not a good person; therefore, I don't dare do this." One of the most ticklish interpersonal problems was beautifully solved when one of our group members was able to say the simple words, "I was wrong."

Somehow related to pride is the trait of perfection. It may surprise you to know that sometimes it is the supervisor who is the most perfectionistic who has the most problems in getting along with people. The perfectionist is often an admirable person with many qualities deserving of respect, but generally she cannot tolerate a fault. Good work may go unpraised, because good work is the least that is expected. But faults are criticized because imperfection cannot be tolerated in others any more than in herself. Of course, she can do all the jobs in dietetics better than any of her workers, and she never hesitates to demonstrate this. But in doing so, she fails to be expert in the one situation that is her true concern—human relations. Her job is people, and since people are not perfect, her perfection gets in the way.

Now let me speak of a quality which is present in all people, which showed itself operating clearly in a number of problems we discussed. Perhaps I should best call it an attitude—the attitude that since there are solutions to problems this means that problems can be solved once and for all. This may, of course, be true of some problems, but it certainly is not true of human problems. Problems are a part of life, and as long as life goes on, so do problems.

Here is an illustration of this attitude in operation. Hospital dietitians have functions which at times and in places appear to overlap with those of other professionally trained personnel. I am thinking principally of the nurse and the physician. If they are uninformed, they are likely to have quite a narrow definition of the dietitian's function which centers around her role as the preparer of food. Her larger role as adviser, consultant, in a word—expert—in all matters relating to food and diets is not readily appreciated. Since this is so, in her relations with her staff personnel it becomes her daily job to interpret her function and define her role. I say, "daily job." This is not something done once and for all, not a problem solved and then forgotten. In a discussion of a difficult interpersonal problem existing on a ward, it becomes quickly apparent that the heart of the conflict was the lack of comprehension by a new physician of the role of the dietitian. He came in with a ready made concept of the dietitian not at all appropriate to her real function. He needed to be educated. All this was readily understood by the group. And to all this the dietitian responded rather wearily, "What again—but I did this last year." But this is not a job that is done in 1955 and not in 1956. It is one's everyday task, and if it is not part of one's job description, it should certainly be read between the lines.

I think this attitude of believing that problems are solved in finality is dangerous. It leads people to oversimplify their jobs, to depend on easy formulas to work out complex difficulties—in short, to believe in magic.

A companion to this attitude is the one which goes something like this. If you don't see a problem, then it's not there any more. We often think we have solved problems, just because we have forgotten about them. This is the way of the ostrich, and I like to think of it as the ostrich motive. It is wonderful to observe to what artful lengths people sometimes go in denying that problems exist. Such a lot of energy is used in doing so. I have seen whole groups afflicted. They behave like a bunch of conspirators who are determined to believe at all costs that life not only can be, but actually is beautiful. They tolerate no flies in their ointment. No doubt they resent problems as vulgar intruders on a perfectly ordered and refined existence. Yet to the extent that the dietitian is a supervisor—or to put this in its broadest context, to the extent that she carries out her work in an interpersonal field, then to this extent does the daily solving of problems become her lot.

Very often these problems remain the same problems. If this is really understood, then problems are no longer resented as intruders to be eliminated from the scene as quickly as possible. They become instead part of one's daily lot, to be understood and worked with today and every day. With an attitude like this, problems lend excitement to a job, to say nothing of challenge, and one can find the prospect of dealing with them a cheerful one, sometimes even an exhilar-

ating one. Interpersonal problems particularly add a dimension to one's job that frees one of imprisonment in the sheer mechanics of getting a job done. It is working in this dimension that increases self-awareness, that contributes to a growth which is not simply professional, but also human.

Communications

Now I would be awfully old fashioned if I did not say a word about communication. Communication is called the number one problem of management. It is, after all, the machinery of interpersonal relations—at least I have heard it referred to as such. I dislike thinking of it in such terms, however. It emphasizes too much the mechanics of communication, and then one begins to think of communication as a skill of the trade to be mastered like a telephone switchboard. It then becomes a matter of plugging in the right connections, of making sure the circuit is complete, that there are no shorts, that no one has blown a fuse, that the feedback is okey, and that one has mastered human engineering. Or is this really automation applied to human relations? I think there is that danger.

I believe it makes more sense to think of communication in a larger framework, to think of it as interpersonal relations itself. You certainly can't have one without the other. Communication is not simply the giving of information, any more than dietetics is simply the preparation of food. One must care about what happens to the information, how it is assimilated and used and responded to. I have found that what is called a breakdown in communication is a failure in personal relationships. Thus, one hears the old refrain, "If I told her once I told her a thousand times. Sure I communicated to her."

This, of course, is the mechanical view of communication. However, if you ask the question, "You told her, but did she hear you?" then you enter the large realm of interpersonal relations. One is forced to consider what there is in a relationship between two people that prevents one person from hearing what the other has been saying a *thousand* times. Would I be saying anything very enlightening if I told you that communication breaks down more for the want of mutual respect than for the want of information? No, I'm sure you know this. What we want to know is how to achieve this mutual respect.

This brings us back to the motives of people, the "whys" of human behavior. Psychology is the science of human behavior, of understanding *why*. To have a psychologic viewpoint we don't have to be psychologists, but we must want to understand. Understanding breeds respect, but in itself understanding certainly doesn't lead to the solution of all problems.

I should have put your minds at rest in the very beginning by stating categorically that there *are* such things as unsolvable problems in the interpersonal realm as in every other. Yet think what a powerful tool understanding is even in the realm of the impossible. What we cannot change surely we can accept, provided we understand *why*. This is enough to save us from endless frustration, anger, and futility. Everything which promotes this understanding is good: the study of books, the taking of courses, the group meeting, the talks with colleagues, the round-table discussion in the Dearborn style, and neither last nor least—the deep look into oneself.

Summary

I have tried to illustrate what I believe must be general problems in human relations in the field of dietetics. My experience with the Dearborn group took these problems away from theory and made them alive for me. When I talk about the problems of my Dearborn group, I imply no criticism. On the contrary I have nothing but admiration for them. Really, my chief task was to get them to express for themselves what they already knew. The encouraging thing about this work was how large a return I received for my small expenditure of effort. My people were already doing a first-rate job. They showed that dependable wisdom that comes only from experience and self-searching. They certainly did not "need" the services of a psychologist. But they did benefit from them. As good as they were, they ended up feeling they could be even better.

Where did this feeling come from? It came from a determined effort to look at one's interpersonal relations without fear. Certainly it did not come from my teaching them any new techniques. In this field there are no gimmicks or short-cuts, no maneuvers or tricks which let you win friends and influence people. There are no substitutes for sincerity, fair play, and the respect which must be accorded the self and others. My function, then, was simply to provide the conditions for the expresison, clarification, and integration of psychologic skills and insights that were already there. I fancy myself somewhat in the role of the obstetrician who might be necessary to the delivery, but who hardly deserves credit for the whole baby.

As I consider what I have said in these remarks about motives, interpersonal relations, and concepts which clarify them, I do not seem to have produced any concluding principle. I probably shouldn't even try, but just the same, I shall. I believe that one is well on the way to happier, more effective human relations when one begins to think about them, when one is content to be a searcher rather than a finder. There is only one solution to human problems, and that is trying actively to understand them. This understanding is never completely won, for in human relations there are no final answers. Every answer breeds more questions, and our focus must be on the questions and not on the answers. I believe we shall have learned a good deal about human relations when we have learned to ask *why*.

Adequate Roasting Procedures for Frozen Stuffed Poultry[1]

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THIS investigation was undertaken to determine roasting procedures for cooking frozen stuffed poultry that would be adequate to destroy food poisoning bacteria if present, and which would, at the same time, result in a good quality cooked product. Data on heat penetration for different weight classes of frozen stuffed and thawed frozen stuffed poultry were obtained and evaluated in relation to the degree of lethality towards food poisoning bacteria. Observations were also made on the ultimate quality of the roasted poultry. The time during which the temperature in the center of the stuffing of each bird was in the so-called "dangerous incubation zone" of 50° to 120°F. was also noted and appears in the data.

The appearance of frozen stuffed poultry on the market has apparently met with considerable consumer acceptance. At the same time, the advent of this product has raised certain questions in regard to its public health aspects and adequate cooking procedures. Packers' recommendations often include procedures for roasting from the frozen state.

Review of Literature

A review of the literature shows only a limited amount of data on the heat penetration of poultry during roasting. Of particular significance from a public health standpoint is the need for information on roasting of stuffed poultry and its lethal effect on any food poisoning bacteria that may be present. There is no reference in the literature to the lethality obtained when stuffed birds are roasted directly from the frozen state.

Iacono, Ball, and Stier (1) studied the roasting time of unstuffed turkeys from both the frozen and thawed states. Their data indicate that the birds are in the optimum growth range for Staphylococci and Salmonellae too short a time to permit extensive growth of the organisms. Thus, there is no apparent danger of food poisoning due to these organisms when unstuffed turkeys are roasted from the frozen state under the conditions specified.

According to Castellani *et al.* (2), frozen poultry including stuffed poultry is a highly perishable product and should be carefully handled during thawing, cooking, and subsequent holding. A temperature of 165°F. should be reached in the center of the stuffing during the roasting period. This temperature can be reached during the normal cooking of stuffed birds weighing less than 18 lb. Roasting should be completed at one time. In larger stuffed birds, however, heat transfer during cooking is too slow to provide temperatures adequate to destroy potentially harmful bacteria at the center of the stuffing.

Bacteriologic investigations on frozen stuffed poultry have been reported by Esselen and Levine (3). They found that the aerobic, anaerobic, and putrefactive anaerobic populations in the dressing of frozen stuffed chickens showed no significant changes during storage of the chickens for twelve months at −10°F. The packaging material appeared to have no significant effect on the bacterial content of the dressing. During thawing and holding at room temperature, frozen stuffed chickens showed a marked increase in aerobic and anaerobic bacteria counts after 20 hr. Spores of a putrefactive anaerobe inoculated into the stuffing prior to freezing showed no evidence of germination and growth.

Recommendations in numerous cook books, appear to be based on general observations rather than on carefully controlled scientific studies. For example, where the cooking times and temperatures for a weight class of birds are presented, it is not clear whether the weight refers to the whole bird, the eviscerated bird, or the stuffed bird. Indications of internal temperature by means of meat thermometers vary, depending on the exact location in the bird of the thermometer bulb and the thermometer itself.

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[2] Acknowledgment is due The Cryovac Company, Division of W. R. Grace & Co., Cambridge Massachusetts, for its cooperation in the conduct of this investigation.

[3] Miss Brushway participated in this research in partial fulfillment of an Honors Project as a senior home economics student.

Experimental Methods

Commercially prepared, frozen stuffed poultry packaged in Cryovac (an oriented plastic film, copolymer of vinylidene chloride and vinyl chloride) were used in this investigation. All poultry were stuffed with conventional-type bread stuffing except for ten 1-lb. poussins (chickens) which were stuffed with wild rice. To study the effect of size, groups of five frozen birds and five thawed birds of each weight class were roasted at 325°F. in an uncovered pan. A control group of five freshly killed and stuffed 15-lb. weight-class birds were also roasted. The weight classes were: 15-, 12-, 9-, 6-, 2½-, and 1-lb. stuffed birds. The weight in each case is that of the bird plus stuffing (stuffing comprised about 25 per cent of total weight). Except for the 1- and 2½-lb. weight classes and the 6-lb. ducks, the birds were turkeys. The 1- and 2½-lb. weight classes were poussins (chickens) and Cornish Cross broad breasted chickens, respectively.

ROASTING

All birds were roasted in a new 30-in. household-type electric range. The oven was pre-heated for 20 min. The birds were roasted singly or in groups of two depending on their size in order to simulate home cooking conditions. At least five birds were roasted for each variable studied.

Temperature Measurements. Temperature measurements were made at 1½-min. intervals throughout the roasting process and for at least 15 min. after the birds were removed from the oven. Copper-constantan thermocouples were located so as to obtain temperature readings in the oven, in the roasting pan, at the center of the stuffing in the bird, and in the center of the thigh. Thermocouples were connected into a Brown Electronik recording potentiometer so that a complete record of temperatures within the poultry were obtained.

Degree of Doneness. Particular attention was paid to the degree of doneness and adequacy of roasting. A quality scoring system was devised for grading each roasted bird. Initially it was planned to cook the birds to a center temperature of 165°F. This temperature was selected on the basis of recommendations for safe cooking temperatures made by the American Institute of Baking. Our preliminary data, however, indicated that with larger birds of the 12- and 15-lb. weight class, cooking to 165°F. center temperature resulted both in overcooking and heating more than necessary to achieve the desired degree of sterilization.

Cooking the larger birds to 155°F. center temperature before removing from the oven resulted in a lethality equivalent to or greater than that provided by 10 min. at 160°F. In addition, the birds were adequately but not overcooked.

Lethality Calculation. The slowest heating and fastest cooling curves for groups of birds representing each variable were evaluated in terms of destruction of food poisoning microorganisms by the "General Method of Process Calculation" (4). Adequate roasting procedures were considered to be those providing at least the equivalent of a center temperature of 160°F. for 10 min. (Basis: F_{160}° = 10 min. and z = 14°F.) These time and temperature relationships are based on data on thermal destruction for food poisoning organisms in poultry stuffing as reported by Webster and Esselen (5).

Initial Temperature at Start of Roasting. Initial temperatures of −5° to 5°F. were used for frozen stuffed poultry and 30° to 40°F. were used for thawed frozen stuffed poultry. Initial temperature refers to the temperature in the center of the stuffed bird when it was placed in the pre-heated oven.

Roasting Methods. The basic roasting method consisted of roasting at 325°F. in a shallow uncovered pan. The birds were covered with a double layer of cheesecloth and basted as necessary with fats. This method increased the cooking time somewhat but insured a highly satisfactory cooked bird.

To compare other roasting methods, limited numbers of frozen and thawed 12-lb. stuffed turkeys were roasted according to the following procedures:

(a) Packaged in film package in a covered pan, 325°F. oven temperature.

(b) Unpackaged in a covered pan, 325°F. oven temperature.

(c) Unpackaged in a covered pan, 250°F. oven temperature.

(d) Unpackaged in a covered pan, 450°F. oven temperature.

(e) Unpackaged in an open pan, 250°F. oven temperature.

(f) Unpackaged in an open pan, 325°F. oven temperature.

(g) Unpackaged in an open pan, 450°F. oven temperature.

(h) Wrapped in aluminum foil, dull side out, 450°F. oven temperature.

(i) Wrapped in aluminum foil, bright side out, 450°F. oven temperature.

When the covered pan method was used, 1 c. water was added to the pan prior to roasting. In the case of film-packaged birds, the film was peeled back as far as possible 30 to 45 min. prior to the end of the cooking time. In all cases where the covered pan method was used, the cover was removed during the final 30 to 45 min. of cooking to encourage browning.

Aluminum foil-wrapped birds were wrapped tightly in heavy-duty household aluminum foil (0.0015-in. thickness). The foil was removed during the last 30 min. of cooking.

Results

Roasting data are summarized in Table 1 and Figure 1. As might be expected, the roasting time for

TABLE 1

Time in incubation zone of frozen and thawed poultry roasted at 325°F. and recommended roasting times

WEIGHT CLASS	CONDITION	FINAL CENTER TEMPERATURE REQUIRED	SAFE ROASTING TIME FOR $F_{160} = 10$	TIME IN INCUBATION ZONE		RECOMMENDED ROASTING CONDITIONS WITH 325°F. OVEN*		
				Average	Maximum for slowest heating bird	Final center temperature†	Maximum center temperature	Cooking time
lb.		*°F.*	*min.*	*min.*	*min.*	*°F.*	*°F.*	*min.*
15	frozen	154	437	83.4	100	155	165	480
15	thawed	155	303	125.8	142	155	165	330
15	fresh	155	326	132.4	145	155	165	330
12	frozen	155	422	77.0	88	155	165	450
12	thawed	155	291	99.4	111	155	165	300
9	frozen	153	363	72.6	86	165	170	375
9	thawed	155	260	85.6	95	165	170	270
6	frozen	153	280	61.6	69	165	170	300
6	thawed	154	217	75.2	82	165	170	225
2½‡	frozen	151	169	44.6	48	165	170	180
2½‡	thawed	151	127	54.2	57	165	170	150
1‖	frozen	149	115	35.2	38	165	170	135
1‖	thawed	147	72	35.2	39	165	170	90

* For both quality and safety.

† Refers to center temperature when bird is removed from oven. Temperature continues to rise for some time thereafter to 165°F. to 170°F. before cooling begins.

‡ Cornish Cross broad breasted chickens.

‖ Poussins.

frozen birds was considerably longer than for thawed birds. The fresh unfrozen birds of the 15-lb. weight class appeared to require a slightly longer roasting time than did the thawed frozen birds of similar weights. However, the difference is not considered significant, especially since a different stuffing was used in the fresh birds. This stuffing was prepared according to a conventional recipe.

In Table 1 are shown data indicating both the roasting time for good quality and the minimum roasting time for safety of all weight classes, frozen and thawed. Fortunately, roasting times necessary to attain good quality are in excess of those needed for safety.

Although the frozen birds took longer to cook sufficiently for quality and to destroy any possible food spoilage microorganisms, it should be noted that in all weight classes other than the 1-lb. groups, the stuffing of the frozen birds remained in the so-called "dangerous incubation zone" of 50° to 120°F. for less time than was the case with the thawed birds. In the 1-lb. poussins, this time was essentially the same. The significance of this dangerous incubation zone is that in order to prevent growth and development of food poisoning bacteria, foods must be held for a minimum time only in the temperature zone of 50° to 120°F., the temperature range considered favorable to the growth of food poisoning microorganisms. Foods should not be held in this incubation zone for a total elapsed time of more than 4 hr.

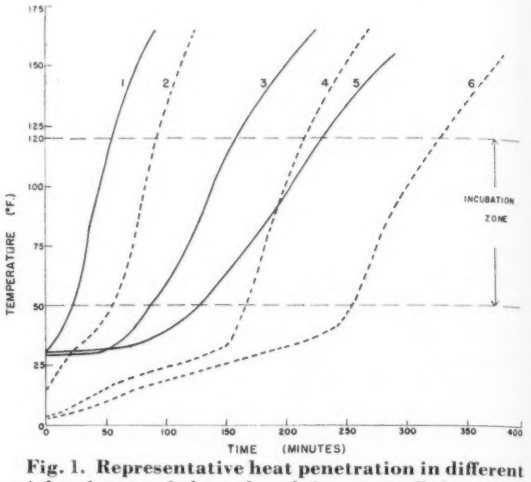

Fig. 1. Representative heat penetration in different weight classes of thawed and frozen stuffed poultry during roasting in an open pan in a 325°F. oven. Curve 1 = 1-lb. thawed birds; curve 2 = 1-lb. frozen birds; curve 3 = 6-lb. thawed birds; curve 4 = 6-lb. frozen birds; curve 5 = 12-lb. thawed birds; curve 6 = 12-lb. frozen birds.

Based on the data obtained, recommended roasting times at 325°F. oven temperature in an open pan are given in Table 2. The approximate time per pound in each case is also shown.

The results of the roasting method studies are also summarized in Table 2. Roasting unwrapped birds at 325°F. in an open pan according to conventional procedure resulted in a high quality cooked product of attractive appearance. The quality of the cooked bird was markedly lessened by roasting in its original plastic film wrapper. Even though cooking time was shortened somewhat, the advantage was considerably offset by a characteristic splitting of the meat and the skin on the breast and thighs. The moisture retained in the package during the first part of the heating period caused the meat to be stewed rather than roasted, resulting in a flavor loss as well as low quality appearance.

Somewhat similar results were obtained when birds were roasted in aluminum foil. One or two cups of juice accumulated in the foil, causing stewing. Birds roasted with the bright reflecting side of the foil facing outwards generally took a few minutes longer to cook than those wrapped in foil with the dull side out.

Three roasting temperatures were used with both the open pan and the covered pan methods: 250°F., 325°F., and 450°F. The roasting time at 250°F. to attain a safe center temperature in the stuffing of either frozen or thawed birds is considerably lengthened and, more important, the time in the incubation zone is markedly increased which is unsatisfactory for a product such as stuffed poultry.

TABLE 2

Recommended roasting times for stuffed frozen poultry cooked by different methods

POULTRY	STUFFED, READY-TO-COOK WEIGHT	CONDITION	COOKING METHOD	RECOMMENDED ROASTING TIME	
				Total	Per pound (approximate)
	lb.			*hr.*	*min.*
Turkey	15	frozen	unpackaged in open pan at 325°F.	8–8½	32
Turkey	15	thawed	unpackaged in open pan at 325°F.	5½–6	22
Turkey	15	fresh	unpackaged in open pan at 325°F.	5½–6	22
Turkey	12	frozen	in film package in covered pan at 325°F.	6–6¼	30
Turkey	12	thawed	in film package in covered pan at 325°F.	4–4¼	20
Turkey	12	frozen	unpackaged in covered pan at 325°F.	5–5¼	25
Turkey	12	thawed	unpackaged in covered pan at 250°F.	8–8¼	40
Turkey	12	frozen	unpackaged in covered pan at 450°F.	4–4½	20
Turkey	12	frozen	unpackaged in open pan at 250°F.	10–11	50
Turkey	12	thawed	unpackaged in open pan at 250°F.	7¾–8	38
Turkey	12	frozen	unpackaged in open pan at 325°F.	7½–8	38
Turkey	12	thawed	unpackaged in open pan at 325°F.	5–5½	25
Turkey	12	frozen	unpackaged in open pan at 450°F.	5–5¼	25
Turkey	12	thawed	unpackaged in open pan at 450°F.	3½–3¾	18
Turkey	12	frozen	wrapped in aluminum foil, dull side out, at 450°F.	6¼–6½	33
Turkey	12	thawed	wrapped in aluminum foil, dull side out, at 450°F.	4–4¼	20
Turkey	12	frozen	wrapped in aluminum foil, bright side out, at 450°F.	6½–6¾	33
Turkey	9	frozen	unpackaged in open pan at 325°F.	6¼–6¾	42
Turkey	9	thawed	unpackaged in open pan at 325°F.	4½–5	30
Turkey	6	frozen	unpackaged in open pan at 325°F.	5–5½	50
Turkey	6	thawed	unpackaged in open pan at 325°F.	3¾–4	38
Duck	6	frozen	unpackaged in open pan at 325°F.	3¾–4	38
Cornish Cross broad breasted chicken	2½	frozen	unpackaged in open pan at 325°F.	3–3½	72
Cornish Cross broad breasted chicken	2½	thawed	unpackaged in open pan at 325°F.	2½–3	60
Poussin*	1	frozen	unpackaged in open pan at 325°F.	2¼–2¾	135
Poussin*	1	thawed	unpackaged in open pan at 325°F.	1½–2	90

* The same recommendations apply when bread or wild rice stuffing is used.

As expected, percentage weight losses from cooking decreased with lower cooking temperatures. At 250°F., there was a 10 to 14 per cent weight loss, 19 to 23 per cent at 325°F., and 28 to 30 per cent at 450°F. using the open pan method. It would appear that the advantage in decreased weight loss at 250°F. is more than offset by the increase in roasting time required.

Roasting at 450°F. was less satisfactory than at 325°F. because of a poorer quality cooked bird characterized by increased dryness and excessive charring of the skin.

Birds roasted at 325°F. by the conventional open-pan method, covered with a cheesecloth, and basted occasionally with fat, were usually golden brown in color, moist, flavorful, and of consistently higher quality than those cooked by the other methods. This was true regardless of whether the poultry was roasted in the frozen or thawed state.

To determine whether there is a significant difference in the heating rates of different types of poultry stuffings, limited roasting tests were made with poussins. Thawed and frozen poussins stuffed with bread stuffing and with wild rice stuffing were roasted by the open-pan method. There was little or no significant difference in the heating rates and roasting requirements of these two types of stuffing.

Table 2 also presents the data for five stuffed ducks cooked in the frozen state in an open pan at 325°F. As expected from their general shape, frozen stuffed ducks required a shorter cooking period than frozen stuffed turkeys of a similar weight.

Discussion

This investigation indicates that roasting frozen and thawed frozen stuffed poultry up to 15 lb. in stuffed weight in an open pan in a 325°F. oven to a degree that would be generally accepted as being adequately cooked from a quality standpoint, also results in a safe bird, i.e., one that has received sufficient heat throughout to destroy potential food poisoning bacteria if present. As a matter of fact, the roasting time required for good quality as judged by appearance, texture, and flavor exceeds the minimum time required to destroy these bacteria.

An important factor in the handling of all food products that provide a good growth medium for food poisoning bacteria is the time in which the product is in the incubation zone, 50° to 120°F., which is most conducive to the growth and develop-

ment of these bacteria. Authorities recommend that such products should not be held for more than 4 hr. in this temperature range. In all cases in this investigation, the stuffing of the birds was in the incubation zone for periods considerably less than the maximum permissible for safety. It is of particular interest to note that despite the longer cooking time required, the frozen birds were in this incubation zone for less time than were thawed birds of similar weight. Thus, it would appear that recommendations for cooking frozen birds would require no special precautions other than to roast to what is generally considered to be a palatable and attractive degree of doneness and to a center temperature as indicated for the different weight classes.

Because larger birds (12- to 15-lb.) have a slower rate of heat penetration and require longer cooking, they may be cooked to a center temperature of 155°F. The smaller birds (less than 12 lb.) which heat more rapidly should not be removed from the oven before a center temperature of 165°F. is reached. In all cases, the temperature continues to rise from 5° to 10° after removal from the oven. In the slower heating, larger birds, the longer times at lower temperature provide sufficient lethality so that a final center temperature of 155°F. is adequate. The roasting times determined experimentally were in good agreement with those based on cooking for quality only as published in recognized cook books.

Summary and Conclusion

An investigation was conducted to determine adequate and safe roasting procedures for frozen and thawed stuffed poultry up to 15 lb. in weight. Recommended roasting times in an open pan at 325°F. oven temperature are presented. These are based on heat penetration data as well as quality evaluation of the roasted birds. Roasting times required for a good quality, well cooked bird appear to be more than adequate from a public health standpoint.

Heat penetration data for 12-lb. frozen and thawed stuffed turkeys roasted by different methods were also obtained. Adequate and safe cooking times and temperatures were derived in each case. In every instance, roasting times required for a well cooked bird were more than adequate from a public health standpoint. On the basis of good quality and appearance, roasting unpackaged birds, either frozen or thawed, in an open pan at 325°F. oven temperature gave the best results. It is interesting that this method is conventionally used and widely recommended by cooking authorities.

Limited data were obtained on frozen 6-lb. stuffed ducks, which indicate that slightly less time is required than for stuffed turkeys of a similar weight.

Heat penetration characteristics and roasting requirements were the same for 1-lb. poussins with either conventional bread stuffing or wild rice stuffing. The type of stuffing did not significantly influence the roasting requirements.

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Is It French Bread or Italian?

When you pick up a piece of hard-crust bread, do you know whether it's French bread or Italian? According to S. Giraldo of the Boudin Bakery, San Francisco, who has been a baker in both France and Italy, as well as the United States, the difference is whether the bread is sweet or sour. Italian bread is sweet and French bread is sour.

To a Frenchman, French bread and sour dough are synonymous. Sour dough bread contains no yeast, no shortening, no sugar. It is cooked in a steam oven to give it a completely cooked texture and outside gloss on the crust.

Italian bread, on the other hand, is what we usually call sweet French bread. The dough contains about all the ingredients found in regular bread and is similar to it except for its shape and the cooking procedure. It is cooked in a conventional oven and without steam.

Actually, Mr. Giraldo points out, these differences are for the purpose of general information to the American public. In Europe, both the French and the Italians make both kinds of bread, and it is a matter of personal preference according to locality or region or custom.—*From The Montague Messenger, San Leandro, California, n.d.*

Low-Sodium Milk

Growth and Consumption Studies with Rats[1]

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RECENTLY, Chaney of Glendale, California, in cooperation with the Los Angeles Heart Association, developed an adaptation of the ion-exchange process for the preparation of low-sodium milk. Since the product is relatively new, studies on its nutritive properties have been limited. Will it support normal growth? Has dialysis removed or reduced factors necessary for optimal growth?

According to information provided by the producer of the milk used in this study[2], lactose, carbohydrates, protein, butterfat, and calories are similar to those in fresh, unprocessed whole milk; the mineral content of the low-sodium and unprocessed milk is given in Table 1.

Information from another producer[3] of fresh low-sodium milk by the Chaney ion-exchange process reveals that the thiamine and riboflavin content of this milk is reduced by approximately 50 per cent.

Various investigators (1–10) have found that, in general, rats on a sodium-restricted diet grow more slowly; exhibit more lesions such as cataracts, ulcers, and scaliness of paws; have a higher mortality rate; and eat less than rats on a control diet. However, there is little agreement as to what constitutes "normal" and "low" levels of dietary sodium.

Work has also been done with rats to learn whether it is possible to obtain normal growth on a diet consisting solely of milk (11–15). Although the results varied in detail, investigation has shown that with supplements to make it nutritionally adequate, optimal growth can be obtained with a milk diet.

The objectives of this study were: (a) to find whether a diet of supplemented low-sodium milk affected the growth and intake rates of rats, and (b) to determine the growth and intake rates of rats receiving low-sodium milk which had been restored to the sodium concentration of whole milk by the addition of sodium chloride.

Procedure

Twenty-four male weanling rats, Wistar strain, twenty-six days old, and weighing approximately 60 gm. each were divided into three groups of eight each. The experiment was carried on for ten weeks. The following diets were furnished to the three groups.

TABLE 1

Mineral content of low-sodium and unprocessed whole milk

TYPE OF MILK	SODIUM	POTASSIUM	CALCIUM
	mg./100 gm.	*mg./100 gm.*	*mg./100 gm.*
Unprocessed whole milk	50	150	125
Low-sodium milk	2–5	225–250	100–125

Group 1. This will also be referred to as the control group. Whole pasteurized, homogenized milk, containing 400 I. U. vitamin D per quart, supplemented three times weekly to contain 1.5 mg. manganese, 0.8 mg. copper, 5.0 mg. iron, and 1.07 mg. iodine per 100 ml. was given. This is a modification of the regimen of McCay *et al.* (14).

The milk was dispensed from a leak-proof feeding bottle and furnished in sufficient quantities to assure *ad libitum* feeding. The daily intake was recorded. Distilled water was also available. To prevent introduction of sodium from outside sources, the hands of the investigator and all equipment involved in handling the milk were rinsed in distilled water.

Group 2. Low-sodium milk, containing approximately 5 mg. sodium per 100 ml., supplemented with minerals and presented as above, was fed to the rats in this group. Since low-sodium milk is not fortified, 400 I. U. vitamin D per quart were added. Distilled water was made available.

Group 3. Low-sodium milk, supplemented with minerals and vitamin D as in Group *2*, was restored in sodium to the approximate level of whole milk (50 mg. per 100 ml.) by the addition of sodium chloride. If the growth in Groups *1* and *2* were significantly different, Group *3* would show whether sodium deficiency was the cause or whether some

[1] This paper is based on a thesis submitted in partial fulfillment of the requirements of the degree of Master of Science at Drexel Institute of Technology. Received for publication June 27, 1956.

[2] Milk for control and low-sodium diets was provided through the courtesy of the Walker-Gordon Laboratory Company, Plainsboro, New Jersey.

[3] Released to physicians by Brook Hill Farms, Inc., 5230 Milwaukee Avenue, Chicago, Illinois.

other factor or factors lost through dialyzation might be responsible.

Results

The results are summarized in Table 2 and Figure 1.

SODIUM CONTENT OF DIET

Sodium analyses were made on the low-sodium milk, and from these the mean sodium concentration for the ten-week period was calculated for the low-sodium diet. For the sodium-restored low-sodium group, the amount of sodium added to the milk and the analyzed sodium content were totalled and a calculation identical to that for the low-sodium group was made.

Sodium analyses were not available for the whole milk of the control diet, and the sodium level was based on a concentration of 50 mg. per 100 gm., a figure cited by Davidson *et al.* (16). Since the whole milk was from a pooled source, this may be expected to be virtually constant.

The percentage of sodium in the diets was:

Group 1 (control)	0.0500
Group 2 (low-sodium)	0.0024
Group 3 (sodium-restored low-sodium)	0.0463

MORTALITY AND APPEARANCE

One rat in Group *3* grew very slowly and developed cataracts and paralysis, dying in the ninth week of the experiment. Post-mortem examination revealed the death was due to infected lungs and a cyst on the diaphragm and apparently was not diet-connected. Since its progress was never commensurate with other rats of the group, it was felt that excluding it from the calculations would give data on a basis more comparable with that of Groups *1* and *2*.

Rats from all three groups surviving until the end of the experiment appeared to be equally active, healthy, and free of lesions. Rats in Group *2* exhibited a "salt hunger" which manifested itself in the licking of the sides of the cage, and the hands of the investigator when the rats were being handled. These symptoms, observed from the fifth week, were not present in the rats of the other groups.

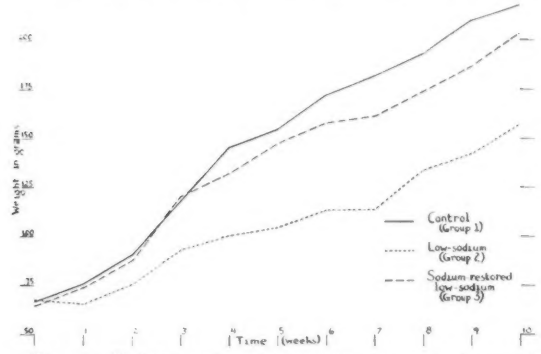

Fig. 1. Weight gain of rats during experimental regimens.

GROWTH

There was overlapping of the growth curves. Some rats in both Groups *2* and *3* weighed more than the lightest in Group *1*.

The mean weight gain of the control group was found to be significantly greater than that of the low-sodium group ($p > 0.001$).[4] The variation between the control group and the sodium-restored low-sodium group was found not to be significant, $0.6 < p < 0.7$.

INTAKE

The average daily intake per rat in the control group, 53.5 ml., was not significantly different from the intake of 53.4 ml. for the sodium-restored low-sodium group, ($p > 0.9$). The difference between the control group and the low-sodium group which had a mean intake of 43.5 ml. per day was found to be significant ($0.01 < p < 0.001$).

To determine whether the lower intake of the rats in the low-sodium group was due to their smaller size or to poor acceptance of the milk, the mean daily intake per 100 gm. body weight for each group was determined. The intake of 35.5 ml. by the control group did not vary significantly from the 38.5 ml. consumed by the sodium-restored low-sodium group ($0.4 < p < 0.3$). The intake of 40.3 ml. per 100 gm. body weight of the low-sodium group was significantly higher ($0.05 < p < 0.02$) than that of the

[4] The null hypothesis was rejected at the 10 per cent level of confidence.

TABLE 2

Data on growth and food intake for rats on varying levels of sodium intake

EXPERIMENTAL GROUP	NUMBER OF ANIMALS	SODIUM CONTENT OF DIET	WEIGHT			MEAN WEEKLY WEIGHT GAIN	MEAN DAILY INTAKE		MILK REQUIRED TO PRODUCE 1-GM. WEIGHT GAIN
			Initial	Final			Total	Per 100 gm. body weight	
				Range	Mean				
		%	*gm.*	*gm.*	*gm.*	*gm.*	*ml.*	*ml.*	*ml.*
Group 1—controls	8	0.0500	66.9	174.2–282.1	218.3 ± 33.4	13.1	53.5	35.5	24.8
Group 2—dialyzed milk	8	0.0024	67.3	129.8–196.7	157.5 ± 24.1	9.0	43.5	40.3	33.8
Group 3—sodium-restored dialyzed milk	7	0.0463	64.5	180.1–266.2	206.8 ± 33.3	14.2	53.4	38.5	26.3

control group. Thus, it was apparent that the smaller size of the rats in the low-sodium group was not caused by failure to eat.

An attempt was made to measure the quality of the three milk diets by calculating the amount of milk required to produce a 1-gm. weight gain. The 24.8 ml. ingested by the control group did not vary significantly from the 26.2 ml. required by the sodium-restored low-sodium group ($0.5 < p < 0.6$). However, the difference between 24.8 ml. and the 33.8 ml. required by the low-sodium group was significant ($p > 0.001$). This would indicate a lower weight-producing efficiency in the low-sodium diet as compared with the other two diets.

Discussion

The reduced thiamine and riboflavin levels of the ion-exchange milk apparently were not limiting factors in this investigation, since animals on a sodium-restored low-sodium milk diet grew as well as those on a whole milk diet. Unfortunately, no vitamin analyses were available for the milk used.

Care must be taken in relating the results of this investigation to human nutrition. While low-sodium milk may be necessary in a sodium-restricted diet for a child, it is unlikely that the child would be living on a ration consisting solely of low-sodium milk, as did the rats in the study.

Moreover, the sodium restriction for the child is usually a short-term affair. Ten weeks in the life of a rat is equal to several years in a human being's life.

If this study can be applied to human nutrition, it would appear that low-sodium milk might be expected to contribute to normal growth, provided the total sodium level of the diet was not drastically reduced. The limiting level of sodium in the growth of the child has not been determined.

The value of weight gain *per se*, as a means of evaluating the diet, may be questioned. Since the rats on the low-sodium diet were as active and appeared to be as healthy as the other rats, was size such an important consideration? Studies pertaining to length of life and reproductive ability could profitably be investigated.

Summary

Three groups of rats were fed diets of whole milk, low-sodium milk, and sodium-restored low-sodium milk for ten weeks. Each diet was supplemented to make it adequate in minerals and vitamin D.

Rats on a diet of low-sodium milk exhibited a significantly lower growth rate and a significantly higher food intake per unit of body weight than those on a whole-milk diet or sodium-restored low-sodium milk diet. Rats on a diet of sodium-restored low-sodium milk exhibited growth and intake levels not significantly different from rats fed whole milk.

On the basis of this experiment, it can be concluded that the level of sodium was the limiting dietary factor.

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Comment

It seems to me that the real thing that needs to be determined as far as human nutrition is concerned is whether the reported reduction in thiamine and riboflavin in the low-sodium milk is of the magnitude to affect the nutrition of human beings who must be on a restricted-sodium diet for a considerable time. On an all-milk diet for rats, even at 50 per cent reduction of these two vitamins, there would still be enough so that a deficiency of either would not show up. However, on a mixed diet comparable to a human diet, where milk was the primary source of these nutrients, in

particular riboflavin, a 50 per cent reduction might well result in some deficiency symptoms. This is a point that needs to be studied. On paper, it would appear that the reduction in riboflavin in low-sodium milk is significant for human nutrition. The study would have been greatly strengthened if vitamin studies could have been included.—*Doris Johnson, Ph.D., Director of Dietetics, Grace-New Haven Community Hospital, New Haven, Connecticut.*

Concerning Dr. Johnson's suggestion that reduced riboflavin levels in low-sodium milk when used "on a mixed diet comparable to a human diet . . . might well result in some deficiency symptoms," reference may be made to the calculated values for a basic pattern for the sodium-restricted diet (Comm. of the Food and Nutrition Bd.; Sodium-Restricted Diets. Natl. Acad. Sciences—Natl. Research Council Pub. 325, 1954, p. 22). In this mixed diet for the adult, allowing 2 cups regular milk, the calculated value for thiamine is 1.29 mg. and for riboflavin, 1.84 mg. If 2 cups low-sodium milk were substituted for the regular milk, and one assumed a 50 per cent reduction in these vitamins, the calculated values would then become: for thiamine, 1.20 mg., and for riboflavin, 1.42 mg. These values still approximate the recommended allowances.

If the milk were increased to 4 cups, which a child might consume, use of low-sodium milk with a 50 per cent loss of thiamine and riboflavin would still result in levels of 1.29 mg. and 1.84 mg. respectively. These are within the allowances for a ten- to twelve-year-old boy.

I agree with Dr. Johnson, however that it is essential to determine the magnitude of changes which have been brought about in the production of low-sodium milk. If indeed there have been serious losses in vitamin content, the dietitian must be fully aware of them in order to plan the sodium-restricted diet more carefully since there becomes less margin of safety. This study suggests, nevertheless, that the lack of sodium was a limiting factor in growth. Certainly the question may be raised whether a severe restriction of sodium for a long time might interfere with the normal growth of children.—*Emma Seifrit.*

BIOGRAPHICAL NOTES FROM THE HISTORY OF NUTRITION

George Richards Minot—December 2, 1885–February 25, 1950

The disease now known as pernicious anemia was first described by Thomas Addison (1) in 1849 and usually had fatal results. But in 1926, there was new hope for patients with pernicious anemia, when George R. Minot with his co-worker, W. P. Murphy, published a paper, "Treatment of Pernicious Anemia by a Special Diet" (2). Minot had for a long time studied the effect of diet on pernicious anemia. His special field of research was blood, and he believed that the bone marrow must need some special food to be able to manufacture normal red blood cells. When Dr. George Whipple of Rochester announced that liver fed to dogs rendered anemic by bleeding, caused rapid regeneration of hemoglobin, Minot began feeding liver to his patients with pernicious anemia. With the aid of Dr. Edwin J. Cohn of Harvard Medical School, fractionation of liver was begun to learn how it acted and possibly to standardize the liver treatment. On January 1, 1928, a highly potent liver extract was made available to the public. Finally, in 1948, vitamin B_{12} was identified as the specific factor in liver, but for twenty-two years, Minot's discovery was the life-saver for patients with pernicious anemia. For his distinguished work, he, along with Murphy and Whipple, received the Nobel Prize in Physiology and Medicine in 1934.

George Richards Minot was born December 2, 1885, son of James Jackson Minot, successful Boston physician, and Elizabeth Whitney. He was a delicate child and grew up shy, tall, and slender. He attended private schools, Harvard College (A.B., 1908), then Harvard Medical School (M.D., 1912), where he was taught physiology and chemistry by such men as Cannon, Henderson, and Folin. Further experience at Massachusetts General Hospital (where there were in those days no dietitians, but the diet of every patient was of concern to him), Johns Hopkins, and Harvard, led to his appointment as Assistant in Medicine at Harvard Medical School and Massachusetts General Hospital; then to Huntington Memorial Hospital to do teaching, research, and general practice. In 1928, he became Director of Thorndike Memorial Laboratory at Boston City Hospital. Research on blood, pernicious anemia, ascorbic acid and anemia, alcoholic neuritis, diet and pregnancy were parts of his program.

Here was a man of insatiable curiosity and desire for understanding, coupled with persistence and industry, and an enthusiasm for teaching with the knack of stimulating curiosity in his students. He always had to watch his health, yet carried a teaching and administrative load that would have made strong men weary. On October 1921, Minot was found to have severe diabetes, and his outlook was indeed grave; but in May 1922, Banting and Best reported their discovery of insulin and in January 1923 enough was available for Minot to receive insulin treatment; for the rest of his fruitful life, insulin, syringes, and dietary scales accompanied him wherever he went. Thus did the discovery of one group save the life of Minot who, in turn, discovered the use of liver and saved the lives of those with pernicious anemia.

In 1947, Minot suffered partial paralysis from a thrombosis in the blood vessels of the brain, but his mind was still clear; he died February 25, 1950.

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Effect of Cocoa and Its Components on Growth and Body Composition of Mice[1]

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IN response to consumer demand, cocoa and chocolate are used extensively as flavoring materials in milk, ice cream, and other products containing appreciable amounts of milk or milk solids. The increased consumption of milk and chocolate milk by school children resulting from the appropriation of $50 million by Congress in August, 1954, for the special School Milk Program, together with the tendency toward greater sales and consumption of cocoa and chocolate-flavored foods, has renewed the question of possible harmful effects of cocoa on growing bodies.

Mueller and Cooney (1) fed groups of rats a diet containing 0.554 per cent calcium and 0.442 per cent phosphorus derived from whole milk powder. The results showed significantly lower calcium and phosphorus retentions and a lower rate of growth of rats fed the diet supplemented with cocoa as compared with the control animals. The authors concluded that indiscriminate and excessive use of chocolate-flavored foods, especially in a diet already low in calcium, should not be recommended.

Bricker *et al.* (2) studied the effect of the ingestion of a moderate-cost American-process cocoa on calcium utilization in eight college women between the ages of eighteen to twenty-two years. Although no statistically significant differences were demonstrated between the calcium balances of subjects on non-cocoa diets and those of the same subjects on cocoa diets, there was a significant effect on the path of calcium excretion.

Lipman and Mueller (3) fed diets of (a) whole milk powder plus a commercial brand of Dutch-process cocoa and (b) whole milk powder plus a commercial brand of American-process cocoa with and without cocoa fat, to albino rats. The findings revealed that the digestibility of milk protein was reduced 7.8 per cent and 6.0 per cent when the ration contained 15.8 per cent Dutch-process cocoa or American-process cocoa, respectively.

The present studies were designed to determine the effects of a low-cost American-process cocoa, a medium-cost Dutch-process cocoa, theobromine, tannic acid, whole fluid milk, and chocolate dairy drink on the growth, food intake, moisture, fat, nitrogen, ash, and calcium content of weanling male mice.

Experimental Procedure

Ninety-six weanling male mice, twenty-one days old, of the CFW strain, were divided into four lots of six sets of triplet litter mates and one lot of six sets of quadruplet litter mates.

Experiments 1 to 4

Five synthetic diets were used: the basal diet; the basal diet into which 1½ per cent low-cost American-process cocoa had been incorporated (diet L-4); the basal diet to which 1½ per cent medium-cost Dutch-process cocoa had been added (diet L-5); the basal diet in which 0.24 per cent theobromine (a component of cocoa) had been mixed (diet L-6); and the basal diet with 0.58 per cent tannic acid (a second component of cocoa) incorporated (diet L-7). The composition of the basal diet is shown in Table 1. The composition of the low-cost American-process cocoa and the medium-cost Dutch-process cocoa is given in Table 2.

For each of the first four experiments, one animal from each of the six sets of triplet litter mates was sacrificed at the beginning of the experiment. Three of these six animals were used for initial body moisture, fat, and nitrogen determinations; the other three were used for initial ash and calcium determinations. In each case, one of the two remaining triplet litter mates was fed the basal diet; the other received one of the four experimental diets, respectively.

Experiment 5

For the fifth experiment, one animal from each of the six sets of quadruplet litter mates was sacrificed at the beginning of the experiment. Three of these

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[2] The authors are grateful to Dr. James L. Carmon, Assistant Professor of Animal Husbandry, for aid in the statistical analysis of the data. Our thanks are due to E. W. Meyers, Chief Chemist, Hershey Chocolate Corporation, and to Stewart H. Griffin, Vice President, C. J. Van Houten & Zoon, Inc., for the cocoa.

TABLE 1

Composition of the basal diet

COMPONENTS	AMOUNTS
Vitamin-free casein*	30 gm.
Salt mixture†	5 gm.
Alphacel*	2 gm.
Lard	15 gm.
Sucrose	48 gm.
Thiamine hydrochloride	1 mg./100 gm.
Riboflavin	1 mg./100 gm.
Pyridoxine	1 mg./100 gm.
Calcium pantothenate	4 mg./100 gm.
Choline chloride	50 mg./100 gm.
Vitamin A ester concentrate	33.75 mg./100 gm.‡
Vitamin D viosterol	1.25 mg./100 gm.⁂
Biotin	20 mcg./100 gm.

* From Nutritional Biochemical Corporation, Cleveland.
† Hawk-Oser salt mixture (4).
‡ Equivalent to 6750 units.
⁂ Equivalent to 500 units.

six animals were used for initial moisture, fat, and nitrogen determinations; the other three were used for initial ash and calcium determinations. In each set, the three remaining mice were fed, respectively: (a) the basal diet plus water (which served as the control diet in this experiment); (b) the basal diet plus whole fluid milk (4 per cent butter fat); and (c) the basal diet plus chocolate dairy drink.

The animals were placed in individual compartments of the experimental cages, in a temperature and humidity controlled room. Food, water, whole fluid milk, or chocolate dairy drink were fed *ad libitum*. The weight of the animals and the food intake were recorded every other day. At the end of five weeks on the experimental regimen, the animals were killed. The fur of the animals was brushed to remove any adhering particles of food. The intestinal tract was removed and discarded; the animal was cut into small pieces. The chemical analysis performed was similar to that performed on the litter mate which had been killed previously at twenty-one days of age for initial values.

The moisture, fat, nitrogen, and ash contents of the mice were determined according to the procedures of the Association of Official Agricultural Chemists (5). The calcium was determined by the McCrudden method (6). Statistical analysis of the data was conducted in accordance with the methods given by Snedecor (7).

Results and Discussion

Growth Data

Data on average initial weight, average final weight, average daily weight gain, total food intake, and average daily food intake for the mice are shown in Table 3.

The mice fed the low-cost American-process cocoa

TABLE 2

Composition of the cocoas used in the experimental diets

COMPONENTS	LOW-COST AMERICAN-PROCESS COCOA*	MEDIUM-COST DUTCH-PROCESS COCOA†
	%	%
Moisture	3.75	8.00
Ash	6.00	7.80
Fat	10.50	24.00
Extractive soluble in water	28.00	25.00
Theobromine	2.08	2.40
Tannic acid	3.98	5.80
Starch	12.20	12.00
Crude fiber	5.50	4.60
Protein	25.00	18.00
Cocoa red	6.00	2.00
Caffeine	0.19	0.30
Oxalic acid	0.60	0.35
Calcium	0.16	0.20

* Analysis by Hershey Chocolate Corporation, Hershey, Pennsylvania.
† Analysis by C. J. VanHouten and Zoon, Inc., New York City.

at 1½ per cent level (diet L-4) grew at a rate comparable to the littermate controls; also, food intake was approximately equal to that of the controls. This finding is in agreement with the finding of Mueller and Ritchie (8), who reported that a 1 per cent cocoa diet produced equally as good growth as a whole milk diet. Interestingly, the medium-cost Dutch-process cocoa at 1½ per cent level (diet L-5) decreased the growth rate of the mice 18.8 per cent. This figure was not statistically significant due to the large individual variation of animals within treatments. In addition to the depressed growth rate, these animals were inactive and the fur was unkempt and oily in appearance, indicating that the medium-cost Dutch-process cocoa had some undesirable effects. Mitchell and Smith (9) have reported that low-cost cocoas depressed growth at a greater rate than high-cost cocoas; the reverse occurred in this investigation. The questionable undesirable effect of the medium-cost Dutch-process cocoa might have been due to the larger amounts of theobromine and tannic acid present as compared with the diet which included low-cost American-process cocoa.

The growth rate of the mice fed 0.24 per cent theobromine (diet L-6) was 12.79 per cent less than for controls; this figure approached significance statistically at the level of $P < 0.05$. The food consumption of these mice decreased 20 per cent. Unpalatability of the diet or an appetite-depressing effect of the diet may explain the decreased food consumption. The general physical appearance of these animals as compared with the animals on the other three experimental diets was the poorest. According to Mueller (10), pure theobromine at 0.27 per cent level was non-toxic to rats. In the case of mice, theobromine at 0.24 per cent level appeared to have

TABLE 3

Data on weight, growth, and food intake

DIET	AVERAGE WEIGHT		AVERAGE DAILY GAIN	FOOD INTAKE	
	Initial	Final		Total	Daily average
Experiment 1—Low-Cost American-Process Cocoa					
	gm.	*gm.*	*gm.*	*gm.*	*gm.*
Basal	7.6	23.3	0.45	108.5	3.10
Diet L-4	7.4	23.2	0.45	112.0	3.20
Experiment 2—Medium-Cost Dutch-Process Cocoa					
Basal	7.0	22.3	0.51	94.9	2.92
Diet L-5	6.6	18.1	0.35	89.5	2.72
Experiment 3—Theobromine					
Basal	6.7	17.2	0.42	76.3	2.60
Diet L-6	7.1	15.0	0.29	62.5	2.08
Experiment 4—Tannic Acid					
Basal	7.1	24.9	0.51	98.7	2.90
Diet L-7	7.3	20.9	0.39	92.4	2.72
Experiment 5—Water, Whole Milk, and Chocolate Drink					
Basal+ water*	8.5	25.9	0.57	113.8	3.33
Basal+ whole milk	8.0	25.3	0.51	78.0	2.10
Basal+ chocolate milk	8.0	27.1	0.56	52.4	1.53

* Control diet for Experiment 5.

some deleterious effects on the rate of growth and food consumption.

Tannic acid at 0.58 per cent level decreased the growth rate of the mice 16.06 per cent. This figure was statistically significant. In contrast to the unkempt appearance of the mice fed the medium-cost Dutch-process cocoa and the theobromine, those fed the tannic acid had clean, smooth coats and clear eyes. Mueller (10) reported that in the rat, pure crystalline tannic acid at 2 per cent level was toxic. In this study, tannic acid at 0.58 per cent level retarded growth but had no deleterious effect on the general physical appearance of the mice. It is apparent that both theobromine and tannic acid may account in part for some of the undesirable effects of cocoas.

The mice fed the basal diet plus whole fluid milk or chocolate dairy drink in lieu of water grew at the same rate as the littermate controls. This finding is in agreement with the report of Newell and Elvehjem (11), who found that rats reared on mineralized whole chocolate milk containing 1 per cent cocoa showed no inhibition of the growth. Noteworthy is the fact the food intake of the mice fed the whole milk and those fed the chocolate dairy drink decreased 36.94 per cent and 54.05 per cent, respectively, as compared with the littermate controls fed the basal diet plus water. These figures were highly significant statistically. The decrease in food intake was not due to unpalatability, because the same basal diet was used as fed to the littermate controls. Thus, both the whole fluid milk and the chocolate milk (to a greater extent) reduced the appetite for the solid food.

TABLE 4

Chemical data on mice receiving experimental diets

DIET	MOISTURE	FAT*	NITROGEN*	ASH	CALCIUM
Experiment 1—Low-Cost, American-process cocoa					
	%	%	%	%	*mg./100 gm.*
Mice at 21 days of age	69.73	4.23	2.88	3.19	135.8
Basal diet	66.77	8.85	2.75	3.52	162.7
Diet L-4	64.45	10.04	2.61	3.53	151.2
Experiment 2—Medium-Cost Dutch-process cocoa					
Mice at 21 days of age	68.98	5.18	2.99	3.25	142.1
Basal diet	65.59	8.82	2.87	3.44	167.1
Diet L-5	60.17	9.63	2.65	3.56	148.8
Experiment 3—Theobromine					
Mice at 21 days of age	69.40	6.21	2.78	2.93	126.6
Basal diet	68.21	6.64	3.12	3.79	142.1
Diet L-6	67.09	9.99	2.85	3.56	140.0
Experiment 4—Tannic acid					
Mice at 21 days of age	68.70	7.96	2.85	2.99	117.3
Basal diet	55.17	16.61	3.33	3.37	168.2
Diet L-7	62.20	14.65	2.72	3.57	166.4
Experiment 5—Water, Whole Milk, and Chocolate Drink					
Mice at 21 days of age	74.63	9.57	2.75	3.24	142.0
Basal+ water†	63.87	11.66	2.81	3.61	174.3
Basal+ milk	61.63	14.79	2.47	3.63	169.9
Basal+ chocolate milk	62.00	14.03	2.40	3.44	167.0

* Wet basis.

† Control diet for Experiment 5.

Chemical Findings

The average moisture, fat, nitrogen, ash, and calcium content of the littermate controls sacrificed at twenty-one days of age and those maintained on the experimental regimen for five weeks is shown in Table 4.

Differences in moisture, fat, nitrogen, ash, and calcium content of animals fed the experimental diets and the litter-mate controls were not statistically significant. However, there were tendencies worth noting, since these tendencies might conceivably become significant if larger amounts of cocoa and/or cocoa components were used or if the experimental period were longer. Moisture and nitrogen of the animals fed the experimental diets were lower than those of the control litter mates. The two cocoa diets, the whole fluid milk, and the chocolate dairy drink resulted in increased fat content of the experimental animals. This was not surprising since the fat in those substances increased the fat content of those diets as compared with the basal diet. Interestingly, the fat content of the mice fed the theobromine was also higher than the littermate controls. On the other hand, mice fed the diet containing tannic acid had a lower fat content than the controls.

The ash content of animals fed theobromine and chocolate dairy drink was less than that of the littermate controls; those fed the Dutch-process

cocoa and the tannic acid had a higher ash content; those receiving the American-process cocoa and whole fluid milk had an ash content equal to the controls.

The calcium content was less in mice fed the two cocoa diets, the whole fluid milk, and the chocolate dairy drink than for the littermate controls. Also, the calcium content of the mice fed the chocolate dairy drink was less than those fed the whole fluid milk. Mice fed the theobromine and tannic acid had a calcium content equal to the controls.

Summary

Growth, body composition, and calcium content of mice as affected by the inclusion in the diet of: American-process and Dutch-process cocoa, theobromine, tannic acid, whole fluid milk, and chocolate dairy drink were studied.

A low-cost American-process cocoa at 1½ per cent level had no adverse effect on growth and food intake of male mice. A medium-cost, Dutch-process cocoa at the same dietary level had a questionable inhibiting effect on the growth and well-being of the animals.

Theobromine at 0.24 per cent level had a growth-inhibiting effect which approached statistical significance. Food consumption was decreased 20 per cent, and the mice appeared to be in poor health. When mice were fed 0.58 per cent tannic acid, the growth rate decreased significantly.

Growth rate of mice fed the basal diet plus whole fluid milk or chocolate dairy drink in lieu of water was equal to that of the littermate controls. However, consumption of solid foods by the animals fed these diets decreased 36.94 and 54.05 per cent, respectively.

There was no statistical difference in the moisture, fat, nitrogen, ash, and calcium content of the experimental mice as compared with the littermate controls. However, values for moisture, nitrogen, and calcium content were lower and those for fat content were higher for the experimental animals than for the littermate controls.

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Use of Nonfat Dry Milk in South

Lack of recipes and inconvenience of reconstituting nonfat dry milk are blocks to wider use of the product, according to results of a survey made of more than 200 women in North Carolina, South Carolina, and Arkansas. H. L. Cook, Rita Dubois, Karl Shoemaker, and A. M. Swanson conducted the survey in the South because it is the greatest potential market for consumer-packaged nonfat dry milk. Of the rural homemakers surveyed, 41 per cent used the product.

The price, brand name, and type of consumer package were found to be the least important considerations when these women bought nonfat dry milk. Flavor was not an important deterent to wide use, either, except among those who used it for drinking as such. Much of it is consumed as buttermilk. Only one-third of those surveyed objected to the taste.

Ninety per cent said they used the product in cooking, and 40 per cent reported using it also for drinking as fresh milk. Only 13 per cent refrigerated the reconstituted milk before drinking it. Baking bread, biscuits, and cake accounted for most of the nonfat dry milk used in cooking.

It is suggested that cookbook publishers could encourage the use of nonfat dry milk in cooking by putting dry milk equivalents in their recipes, along with the usual measurements for fluid and evaporated milk. Also, anything that would reduce the time and trouble of mixing the product would probably increase sales.

Of those who used the product, over two-thirds reported using a package in less than a week, and 90 per cent had used it in less than two weeks. Half preferred the 3½-oz. envelope. Forty-six per cent said they would buy it in 5-lb. packages if it were cheaper by the pound packaged this way.—*From What's New in Farm Science, Annual Report, Part 1, Bull. 518, Wisconsin Agricultural Experiment Station, January 1956.*

Data on the influence of transporting and feeding hogs just before slaughtering on the B-vitamin content of fresh and stored pork loins are reported. Loins stored at 0°F. for forty-eight weeks showed no significant losses attributable to treatment for any of the four vitamins studied—riboflavin, thiamine, pantothenic acid, and niacin.

Vitamins in Meat

Effect of Treatment of Animals before Slaughter on B Vitamins in Pork[1]

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MEAT has become the principal part of the well balanced meal in most of this country and plays a vital role in human nutrition. It is a rich source of high quality protein and furnishes iron, phosphorus, and vitamins in generous amounts. Lean pork, especially, is one of the best sources of the B vitamins. The manner in which animals are treated before slaughter could have a definite bearing on the nutritive value of the meat, particularly the vitamin content. Miller *et al.* (1) studied the pig's ability to store thiamine while Heinemann and co-workers (2) investigated the ability of the pig to store riboflavin, and Hartzler, Ross, and Willett (3) compared the thiamine, riboflavin, and niacin content of pork from animals fed grain with those fed garbage. These and other investigators have reported a direct influence of the dietary intake of the vitamins on the amount found in the muscle tissues.

Lehrer *et al.* (4) studied the effect of freezing, thawing, and cooking on the thiamine, riboflavin, and niacin content of pork chops. They reported a loss of 40 per cent of the thiamine and 31 per cent of the riboflavin after frozen storage at 0°F. for six months, but no loss of niacin. Westerman and colleagues (5) investigated the influence of storage temperature and length of time of storage on the vitamin content of pork loins and found considerable animal variation but no outstanding losses of thiamine, riboflavin, pantothenic acid, or niacin which could be attributed to storage when the temperature was kept at 0°F. or below. Losses due to cooking, however, were 40 per cent for thiamine and 30 per cent for niacin, with little loss of riboflavin and pantothenic acid. Lee *et al.* (6) reported that the rate of freezing did not alter the thiamine, riboflavin, niacin, pantothenic acid, or pyridoxine contents. Westerman, Oliver, and Mackintosh (7) studied the effect on the vitamin content of aging pork carcasses for one, three, and seven days at 30°F. and seven days at 40°F. before storage at 0°F. Loins aged three days at 30°F. had lost 33 per cent thiamine after twenty-four weeks' storage and 20 per cent riboflavin after thirty-two weeks. Pantothenic acid and niacin showed the greatest losses in storage in loins aged one day at 30°F., 24 per cent at sixteen weeks for pantothenic acid, and 18 per cent at thirty-two weeks for niacin.

At the present time, the methods of handling and feeding animals just prior to slaughter are far from uniform. Some farmers haul their animals long distances over rough roads. After the ride the animals are sometimes given water and feed before slaughtering but often not. These practices could influence the nutritive value of the meat by changing the B-vitamin content. The average per capita consumption of pork in the United States is 60 lb. yearly; therefore, it is important that it retain its nutritive value.

The object of the experiments reported here was to obtain specific information on the influence of handling and feeding hogs prior to slaughter on the nutritional value of the fresh and stored pork. The

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[2] The authors are indebted to Dr. H. C. Fryer, Statistician, Kansas Agricultural Experiment Station, for the statistical analysis.

data deal with the thiamine, riboflavin, pantothenic acid, and niacin content of pork loins from animals given five different treatments. Comparisons were made of seasonal variation and also of variation attributed to treatment and storage.

Experimental Procedure

Hogs weighing approximately 300 lb. were given a ride over 50 mi. of rough road just prior to slaughter and treated as follows: 2 animals were given water and 2 hr. rest; 2 were given feed, water, and 2 hr. rest; 2 were given water and 16 hr. rest; 2 were given feed, water, and 16 hr. rest. Two animals (considered as controls) were not taken on the rough ride and were given feed, water, and rest. After the treatments, the animals were slaughtered, the carcasses chilled rapidly to 30°F. and held for 48 hr. before cutting. These procedures were repeated in May and January for three years. The 50-mi. ride was chosen as it is a general opinion that the greatest shrinkage in shipping occurred during the first 50 mi.

Each loin was cut into four samples. The samples were randomized so that data could be analyzed statistically. One was taken for analysis in the fresh state before storage and the others were wrapped, frozen, and placed in storage at 0°F. After removal from storage at eight-week intervals up to forty-eight weeks, the meat was thawed, the outside fat removed, and the rib-eye muscle (longissimus dorsi) dissected out and ground three times in a food grinder. The sample not stored was frozen overnight and thawed before sampling to equalize any changes due primarily to freezing. After thorough mixing, samples were taken for the determination of thiamine, riboflavin, pantothenic acid, niacin, fat, and water. All data are reported on a dry, fat-free basis to equalize some variables. The method recommended for the cooperative meat investigations (8) was used to determine moisture, and the fat was analyzed according to the method of the Association of Official Agricultural Chemists (9). Thiamine was determined by the thiochrome procedure of Hennessy (10); the fluorometric method of Peterson, Brady, and Shaw (11) was used for riboflavin, and the microbiologic methods of Krehl, Strong, and Elvehjem (12) and of Strong, Feeney, and Earle (13) for niacin and pantothenic acid, respectively.

TABLE 1

Average seasonal variation in vitamin content of pork†

DATE	CONTROLS—FEED AND WATER; NO RIDE	ROUGH RIDE			
		Water only, 2-hr. rest	Feed and water, 2-hr. rest	Water only, 16-hr. rest	Feed and water, 16-hr. rest
Thiamine					
	mcg./gm.	*mcg./gm.*	*mcg./gm.*	*mcg./gm.*	*mcg./gm.*
January	82.3***	77.3	81.1***	70.4	70.2
May	62.4	69.9	62.7	70.8	69.3
Riboflavin					
January	6.7*	7.0***	6.5*	6.7***	6.6
May	5.8	5.8	5.8	5.7	6.0
Pantothenic Acid					
January	24.9***	19.8	35.6***	33.7***	30.2***
May	14.6	15.9	17.1	18.0	15.1
Niacin					
January	224.7	219.3	274.6***	240.6**	258.0**
May	220.9	222.6	117.0	116.5	203.2

† All data reported on a dry, fat-free basis.
* Significant at 5% level.
** Significant at 1% level.
*** Significant at 0.1% level.

Results and Discussion

EFFECT OF SEASON

Data on seasonal variations in the vitamin content of the loins are shown in Table 1. On the average, the animals slaughtered in January had a higher content of all the vitamins tested than those slaughtered in May. The loins from the January animals had 19.9 mcg. per gram more thiamine than May animals for those given no ride; and 18.4 mcg. per gram more for those given the ride, feed, water, and 2 hr. rest. These seasonal differences were significant at the 0.1 per cent level. Seasonal differences for the other treatments were non-significant.

For riboflavin, animals slaughtered in January had 0.9 mcg. per gram and 0.7 mcg. per gram more of this vitamin in the loins than those slaughtered in May for the control (without the ride) and those given the ride, feed, water, and 2 hr. rest respectively ($P < 0.05$). Those given water and 2 hr. rest after the ride had 1.2 mcg. per gram more riboflavin and those given water and 16 hr. rest, 1.0 mcg. per gram more ($P < 0.01$) in January than in May.

Pantothenic acid showed the same seasonal trend as thiamine and riboflavin. Differences varied from 10.3 mcg. per gram for those without the ride to 18.5 mcg. per gram for those given the ride, feed, water, and 2 hr. rest ($P < 0.001$). Only those given the ride, water, and 2 hr. rest showed no seasonal differences.

The niacin content of the loins from the January animals was significantly higher than the May animals for three treatments. Those given the ride, feed, water, and 2 hr. rest has 157.6 mcg. per gram more niacin ($P < 0.001$) in the loins; those with the ride, water, and 16 hr. rest, 124.1 mcg per gram more; and those given food in addition, had 55.8 mcg. per gram more niacin in January than in May ($P < 0.01$). Seasonal differences for the other two treatments were not statistically significant.

EFFECT OF TREATMENT

Animals slaughtered in January showed significantly lower thiamine content (70.4 mcg. per gram) for those given the ride and 16 hr. rest contrasted

with those not given the ride (82.3 mcg. per gram); or those given the ride and 2 hr. rest (77.3 mcg. per gram); and ride, food, water, and 2 hr. rest (81.1 mcg.1 per gram) ($P < 0.05$) for treatment. The differences were non-significant between animals given no ride and those given a rough ride, water, and 2 hr. rest; and between those given the ride, feed, water, and 2 hr. rest (Table 1). Evidently after the rough ride, the longer rest period allowed a decrease of thiamine in the tissues. Probably the thiamine resources were called upon for metabolic processes during this longer resting period and were not replaced. The cold weather in January may have required more energy expenditure and, if carbohydrates were used to furnish the energy, thiamine was required for the metabolism of the carbohydrates. Animals slaughtered in May showed no statistically significant variation in thiamine which could be atrributed to treatment.

The riboflavin content was not affected significantly by treatment. However, pantothenic acid like thiamine was influenced significantly, especially during the winter. Those taken on a ride and given food, water, and 2 hr. rest averaged 35.6 mcg. per gram pantothenic acid in the loin, while those given water and 16 hr. rest averaged 33.7 mcg. per gram, and those given food, water, and 16 hr. rest averaged 30.2 mcg. per gram. These amounts of pantothenic acid were significantly higher ($P < 0.05$) than the 24.8 and 19.8 mcg. per gram, respectively, found in those given no ride, feed, and water, and those given the ride, water, and 2 hr. rest.

The same trend was found in the niacin content for animals slaughtered in January. Those given the

TABLE 2

*Average vitamin content of pork loins before and after storage at 0°F.**

WEEKS	CONTROLS—FEED AND WATER; NO RIDE		ROUGH RIDE							
			Ride, water, 2-hr. rest		Ride, feed, water, 2-hr. rest		Ride, water, 16-hr. rest		Ride, feed, water, 16-hr. rest	
	Average content	Average retention	Average content	Average retention	Average content	Average retention	Average content	Average retention	Average content	Average retention
	Thiamine									
	mcg./gm.	*%*	*mcg./gm.*	*%*	*mcg./gm.*	*%*	*mcg./gm.*	*%*	*mcg./gm.*	*%*
0	77.7	—	85.6	—	82.1	—	72.6	—	71.8	—
8	77.2	99	80.3	93	72.9	89	74.5	102	70.5	92
16	72.9	93	72.7	85	71.4	87	63.6	87	74.8	97
24	77.0	99	67.3	79	73.6	89	76.1	104	67.2	87
32	69.3	89	71.7	84	67.2	82	67.6	93	69.3	90
40	65.1	83	69.3	81	71.0	92	68.5	99	62.2	80
48	67.4	86	68.4	80	65.5	80	71.4	98	67.0	87
	Riboflavin									
0	7.0	—	7.3	—	6.7	—	7.0	—	6.5	—
8	6.3	90	6.5	89	6.1	91	6.3	90	6.0	92
16	5.8	82	6.0	82	6.2	92	6.1	87	6.4	98
24	5.7	81	6.5	89	6.6	98	6.0	85	6.2	95
32	6.1	87	6.6	90	5.9	88	5.7	81	6.0	92
40	6.3	90	6.6	90	6.3	94	6.2	88	6.4	98
48	6.6	94	5.8	79	5.4	80	6.2	88	6.4	98
	Pantothenic Acid									
0	18.2	—	16.4	—	25.7	—	25.5	—	21.6	—
8	18.8	108	18.1	110	25.8	100	26.0	101	22.9	106
16	18.1	99	17.8	108	30.9	120	25.0	98	21.5	99
24	18.6	102	17.5	106	26.4	103	26.6	104	22.6	107
32	22.4	123	19.9	121	27.7	107	27.0	105	25.0	115
40	18.8	103	18.4	112	28.9	112	26.9	105	22.9	106
48	22.5	123	17.0	103	25.5	99	24.2	94	22.1	102
	Niacin									
0	206.7	—	259.2	—	266.0	—	228.5	—	230.5	—
8	218.5	105	217.4	80	245.9	92	214.4	94	220.7	95
16	245.5	118	234.2	90	226.3	85	197.2	86	242.6	105
24	216.1	104	200.6	77	193.9	73	191.1	83	230.9	100
32	194.9	94	196.8	75	218.9	82	204.3	89	235.4	102
40	209.6	101	208.0	80	212.5	80	201.6	88	225.1	97
48	225.8	109	218.8	84	210.7	79	188.0	82	231.1	100

* All data reported on a dry, fat-free basis.

ride, food, water, and 2 hr. rest averaged 274.6 mcg. per gram of this vitamin in the meat, followed by 258.0 mcg. per gram for those given food, water, and 16 hr. rest and 240.6 mcg. per gram for those given water and 16 hr. rest. These amounts were significantly larger ($P < 0.05$) than in the animals receiving food and water but no ride (224.7 mcg. per gram) or in those given the ride, water and 2 hr. rest (219.3 mcg. per gram). The feed and longer rest period seem to account for the larger amounts of these vitamins in the muscle.

EFFECT OF FROZEN STORAGE

The effect of treatment of the animals before slaughter on the B-vitamin content of the loins during storage at 0°F. is shown in Table 2. Storage losses varied with the different treatments. Thiamine retention was highest in those animals with no ride or in those with the ride and more hours of rest. The percentage retention was fairly high (87.6 per cent or more) until forty weeks of storage. For all treatments and storage periods, the lowest percentage retention in the loins from animals given the rough ride and 2 hr. rest, with and without feed, was 79 per cent after forty-eight weeks' storage.

The riboflavin retention was also high during storage with little or no losses of this vitamin in animals given feed and the longer rest period. Also there was no loss of pantothenic acid during the storage period for any of the treatments. Niacin, like thiamine, showed the least retention in animals given the ride and the short rest period, and almost none of this vitamin was lost in those without the ride and with feed or in those given a longer rest period after the rough ride.

The statistical analysis of the data indicated there were no significant differences that could be attributed to treatment, in the amounts of any of the four vitamins in the loins.

Summary

Data on the influence of handling and feeding hogs prior to slaughter on the thiamine, riboflavin, pantothenic acid, and niacin content of pork loins are reported for five different treatments. The data indicate that animals slaughtered in January had a higher content of each of the vitamins in the loins than those slaughtered in May. Thiamine and riboflavin was highest in the animals given no ride and in those given a rough ride and 2 hr. rest. Pantothenic acid and niacin contents were highest in animals given the rough ride, feed, and 2 or 16 hr. rest. Storage of the loins for forty-eight weeks at 0°F. resulted in no significant losses attributable to treatment on any of the four vitamins studied.

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How Much Authority Should a Supervisor Have?

"I never short-circuit a manager or a supervisor," said Grace Rust Frick of Russet Cafeteria, Cleveland, in speaking at the National Restaurant Association convention in Chicago in May. "The supervisor must be head of the house in her own department. I make it a point never to give a direction to an employee who is not directly under me."

She also commented, "In choosing a manager, I try to get someone from a larger family or one who once lived on a farm. These people usually know how to take responsibility. I also try to find a person with a cheerful disposition and good feet."

Body Measurement and Evaluation of Nutritional Status

Methods and Norms in Nutritional Anthropometry[1]

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THE purpose of this presentation is to review the highlights of a Conference on the Role of Body Measurements in the Evaluation of Human Nutrition. The conference was held on June 17 and 18, 1955 at Harvard University under the sponsorship of the Committee on Nutritional Anthropometry of the Food and Nutrition Board, National Research Council. The Proceedings were published as a special issue (May 1956) of *Human Biology* and have been reprinted in book form (1).

The Proceedings consist of: (a) a corporate effort, introduced by Dr. Ancel Keys as the Committee's chairman, to define the minimum number of measurements considered useful for the characterization of nutritional status and (b) twelve research papers concerned with special topics. Before reviewing the recent developments, it may be useful to have a look at an earlier endeavor to systematize body measurements of potential interest to the nutritionist.

Nutritional Anthropometry—1936

The problems of selection and standardization of body measurements is not new to American home economists concerned with human nutrition. Only recently it came to this writer's attention that Dr. Ales Hrdlička, the late curator of the Division of Physical Anthropology, U. S. National Museum, Smithsonian Institution, and founder of the *American Journal of Physical Anthropology*, was interested in this matter and cooperated personally with agricultural experiment stations using anthropometry in describing one facet of nutritional status.

It may be of historical interest to discuss, in some detail, his contacts with workers engaged in the cooperative regional research project on "The Nutritional Status of College Women as Related to Their Dietary Habits," sponsored by certain home economics sections of the agricultural experiment stations of the North Central states. The principal source of information are the mimeographed "Minutes"[2,3] of the First Research Conference, held at Iowa State College, October 23 to 27, 1936, and the separate "Outline of 'Master' Project" which contains principally the directions for making a variety of measurements to be used in the cooperative study and lists of references. Basal metabolism tests, balance studies, records pertaining to students' health history and medical information, and food records were considered in addition to anthropometric measurements, determinations of erythrocytes, hemoglobin concentration in the blood, and vitamin stores. The bibliography for anthropometric measurements was focused on body measurements of college and university women, without regard to the more specific methodologic problems of nutritional anthropometry.

One of the central aims of the Iowa conference was to adopt specific methods to be used by all cooperating groups and to acquire skills in certain techniques

[1] Presented at the Annual Meeting of the American Dietetic Association in Milwaukee, on October 12, 1956.

[2] Since, as far as the author knows, only one copy of the mimeographed "Minutes" and of the "Outline of 'Master' Project" is still extant, these are not listed in the bibliography. It is for this very reason, in view of the important information they contain, that their contents are summarized in some detail here.

[3] It is a pleasure to acknowledge the help provided by Dr. Jane M. Leichsenring, University of Minnesota; Dr. M. A. Ohlson, State University of Iowa; and Dr. P. Swanson, Iowa State College, in tracing the story of Dr. A. Hrdlička's cooperation with the agricultural experiment stations. It might be useful to cite, for the record, a paragraph from Dr. Ohlson's letter of May 24, 1956: "My first contact with Dr. Aleš Hrdlička was in 1936 when Iowa State College invited him to a workshop on techniques of nutritional anthropometry. The various representatives of the agricultural experiment stations from the North Central area were also invited, and the group spent one week working directly with Dr. Hrdlička. Following this early contact, I kept in touch with him largely through letters until shortly before his death. He was kind enough to edit the first paper on anthropometry which this group published."

necessary for carrying out the project. Dr. Hrdlička was invited at the suggestion of Dean R. E. Buchanan, Director of the Iowa Agricultural Experiment Station, to attend the Conference and to discuss the significance of anthropometry in the description and interpretation of the nutritional picture of the college women. In addition, he also instructed the group, by means of demonstrations and actual laboratory exercises, in taking the selected measurements in a correct and uniform fashion. Following Hrdlička's introductory lecture on "Anthropometry as a Tool in the Evaluation of the State of Nutrition," there were five other 2-hr. sessions devoted to anthropometry. Over twenty senior workers participated in the Conference, representing eight universities or colleges and the federal Bureau of Home Economics. Dr. Pearl P. Swanson served as a secretary for the Conference. Dr. Margaret A. Ohlson presented the objectives of the anthropometric phase of the study. These included a more adequate evaluation of nutritional status, e.g., prediction of "standard" weight from measurements other than height alone; evaluation of late growth; and provision of proper reference standards in evaluating physiologic characteristics of individuals, especially basal oxygen consumption.

Hrdlička's presentation was informal and, to the writer's knowledge, his ideas on the subject were not published. His earlier concerns with nutrition were medical rather than anthropometric, including the provision of cod-liver oil for children and pregnant women among Alaskan natives. He stressed that anthropometry may be of real help to the nutritionist, but it must be backed with a great amount of experience and caution, with a full dose of trained common sense, and, also, with medical sense.

The fact of ever-present differences between healthy individuals served as a point of departure in discussing the application of body measurements to the evaluation of nutritional status, and the participants were warned not to attach health significance hastily to deviations from group averages. A short-statured child is not necessarily "subnormal." It was Hrdlička's opinion, and we have no disagreement to register on this point, that the number of useful body measurements is small. The list of "essential" items which, in his opinion, would serve to describe differences in nutritional status (2) included stature, body weight, breadth and depth of chest, maximum circumference of the upper arm (right and left, below the insertion of the deltoid muscle), and maximum circumference of the left leg. Weight was to be reported as nude weight, in kilograms; the metric system was recommended for all the measurements. The indication of the "tolerance limits" within which different measurements should fall when repeated was a useful feature of Hrdlička's presentation. He referred to his *Anthropometry* (3) as a manual describing in detail the techniques of measurement. However, this volume, even in the subsequent editions (4), does not consider specifically the problem of the anthropometric appraisal of nutriture.

As noted earlier, Hrdlička trained the assembled research personnel in the actual making of body measurements. The emphasis on the *uniformity* of measurements was, unquestionably, wholesome. We cannot agree fully with his evaluation of the *usefulness* of the specific body measurements. In nutritional context, chest diameters of adults are useful (if measured with pressure on the calipers so as to exclude the contribution of subcutaneous fat) as predictors of "standard" body weight. Thoracic index (depth/breadth) may be valuable in following a child's development but is of limited use in the characterization of adult nutritional status. Hrdlička mentioned that the more measurements are taken, the more difficult it is to arrive at final conclusions. The indexes just noted belong to this superfluous category. It was not noted that the measurements of bony size (plus muscular development but minus adipose tissues) can be integrated in a form of a single, multiple-variable equation for the prediction of the individual's expected body weight.

Hrdlička did not consider the measurement of the breadth of pelvis as an essential measurement. In regard to a question concerning the significance of measuring subcutaneous fat, he answered, "We measure all that together in getting the circumference of arm and leg." Nothing could "date" his views on the subject more precisely.

Nutritional Anthropometry—Recent Developments

The principal new element in nutritional anthropometry is the emphasis on bony measurements as a basis for the estimation of "standard" weight, and on body composition (in contrast to sheer size or bulk) as the basic criterion of nutritional status. Beyond the estimate of overweight-underweight, we wish to characterize a subject in terms of relative adiposity and muscular development. Not that this is a truly new idea—skinfold measurements have been made for over sixty years, and a method for the partitioning of body weight into its principal components that can be estimated on the basis of body measurements was proposed thirty-five years ago (5). The author was Hrdlička's life-long friend, and he published the paper in the *American Journal of Physical Anthropology*.

The experiences of the last ten to fifteen years strengthened significantly the conviction that body weight is a *limited*—on occasion, a deceiving—criterion of nutritional status. The development of techniques for the study of body composition, especially for the estimation of total body fat, in the living man provided a fresh stimulus for the appraisal of body measurements, their usefulness, and their limitations.

The anatomists also responded to the challenge, albeit with a long reaction-time. Skeletal weight pro-

vides a useful reference point in the anthropometric study of gross composition of the human body. Nevertheless, the precision with which it can be estimated from body dimensions was not known. It was only in 1954 that the validity of the bony measurements considered by Matiegka for predicting the weight of the skeleton in the living was examined (6). It was found that in dry, fat-free skeletons, stature had the highest correlation of all linear dimensions with the skeletal weight ($r = 0.691$). With four bony widths (maximum transverse diameters of the lower end of arm, forearm, thigh, and leg) added, the coefficient of multiple correlation increases only very slightly ($R = 0.736$). The breadth of pelvis did not prove to be a useful predictor of the weight of the total skeleton (7). In the long limb bones, ash represents about 67 per cent, the organic component about 33 per cent of the bone weight. For complete skeletons, the average ash percentage is somewhat lower (about 65 per cent). There appeared to be only a small reduction in the percentage ash weight with age.

Recommended Measurements—1955

While the recommendations (8) cannot be regarded by any means as final—the information at hand is just not that complete—the selection of a small number of measurements (see Table 1), with guidance as to their biologic significance, relative importance, and directions for carrying them out, will be found useful by professional personnel concerned with the evaluation of nutritional status.

It was realized that no rigid selection is possible because in different situations—in an out-patient clinic or a physician's office, in a field survey, in a research laboratory—the availability of time and the specific goals of the study may dictate a different choice of measurements. Under emergency conditions, height and weight may be all that can be obtained. Whenever feasible, the width of the pelvic girdle (measured as the bicristal diameter and serving as a measure of the width of the skeletal framework) and the skinfold measured at the back of the upper arm (as a measure of leanness-fatness) should be added. These four measurements were designated in the table as variables of "primary" importance. Measures of the thickness of the subcutaneous fat on the trunk (subscapular skinfold), muscular development of the upper arm (circumference or the approximate diameter calculated from the circumference, corrected for subcutaneous fat), and the bony width of the shoulders (biacromial diameter) are useful additions. Vertical partitioning of the stature into "legs" and "trunk" (plus head) appears to be less relevant for the estimation of "standard" weight.

Specific Studies

Significance of individual variations in skeletal frame for arriving at "standard" (reference) weight was considered on the basis of data on firemen (9) and young army men (10). In the first study, the width of the limb bones, sampled in the form of the maximum transverse diameter of the lower end of the upper arm (distance between the epicondyles of the humerus) was also considered, and the corrected diameter of the upper arm as a measure of muscularity was included in predicting man's "standard" weight.

Using all five bony measurements as well as a measure of muscular development and age, a coefficient of multiple correlation of $R = 0.772$ was obtained. Eliminating the two bony measurements that do not contribute significantly to the accuracy of prediction, an equation was presented in which the "standard" weight is predicted from height, bicristal diameter, biacromial diameter, arm diameter, and age.

White (10) considered the factor of linearity-laterality of body build in reference to bi-iliac (bicristal) diameter and chest breadth, both measured by an anthropometer with pressure being applied so as to approximate the bony framework. "Standard" body weights were calculated for each inch of stature for individuals of narrow, medium, and wide skeletal frame. Variations in trunk height were found to be a less important source of variability in body weight.

Agreement on the pressure to be used in skinfold measurements (10 gm. per square millimeter of the contact surface) will facilitate the establishment of descriptive norms of leanness-fatness. Brožek (9) presented data on the distribution of the upper arm and subscapular skinfold in a random sample of firemen. Newman (11) reported data on young American men and considered differences between regional and racial sub-samples. Measurements of the upper arm skinfold were included in the extensive Canadian weight-height survey (12). The averages indicate clearly the age trends and the sex differences (for

TABLE 1

Measurements recommended for the characterization of nutritional status in adults

MEASUREMENT	BIOLOGICAL MEANING	IMPORTANCE AS CRITERION OF NUTRITIONAL STATUS
Body weight	body bulk	primary
Stature	total body length (size)	primary
Sitting or cristal height	trunk vs. legs	tertiary
Bicristal diameter	linearity-laterality (pelvic girdle)	primary
Biacromial diameter	linearity-laterality (shoulder girdle)	secondary
Upper arm skinfold	fatness (limbs)	primary
Subscapular skinfold	fatness (trunk)	secondary
Upper arm circumference, less fat	muscular development	secondary

ten-year-old boys, 7.4 mm; for girls, 9.5 mm; for forty-five- to fifty-four-year-old men, 7.5 mm; for women, 17.7 mm). Norms, in the form of percentiles, are given separately for twenty-three age groups. Data on height and weight are presented in a similar way.

Age changes in body composition, with special reference to children and women as the subjects and to the measurement of body water as the method, were examined on the basis of the data from the literature by Hunt and Giles (13). Information available on other mammals was also considered.

The study on adult women, including measurements of arm and calf circumferences (2), covers a topic on which little information has been available in the literature. Recently, skinfold measurements were added to differentiate more sharply between individual differences in physique due to body build and to fatness.

Skinfold measurements enable us to evaluate the individual's leanness-fatness against the distribution of skinfold thicknesses obtained for a normative group. For metabolic studies, we may wish to know not only the relative fatness but to estimate the total amount of fat, derived from body density (14). The available prediction equations (15, 16) were based on skinfold measurements made with a caliper of high initial tension (about 35 gm. per square millimeter), and there were some other methodologic limitations. Making use of recent refinements and standardization in techniques for measuring both skinfold thickness and body density, Pascale *et al.* (17) examined the correlations between skinfolds measured at ten sites and body density in young men. The skinfolds measured at the side of the chest, next to the nipple, and at the arm represented the best combination of measurements, yielding a coefficient of multiple correlation of $R = 0.8495$.

In considering the differences in man's physique, we may be concerned with (a) their etiology, i.e., the role of nutrition, exercise, genetic factors, disease; and (b) their implications—gauged in terms of correlations with physiologic functions measured at a given time, growth (in infants and children), health, and longevity.

It was observed repeatedly that fatter children tend to be, on the average, somewhat taller, more advanced in skeletal development and dentition, and attain sexual maturity earlier. Garn, Greaney, and Young (18) examined the relation of the amount of subcutaneous fat on the left lower leg to size (bony length), muscularity, and the rate of growth in infants. The fatter infants significantly exceeded the leaner ones in body length at one month but not later. The mean differences in crown-heel length and, more definitely, in the length of the tibial shaft retain the same direction, but at single age comparisons, they do not reach the 5 per cent level of statistical significance. The authors did not attempt to consider statistically the over-all picture by combining the data obtained at the five age levels (one, three, six, nine, and twelve months). This would have resulted almost certainly in a statistically significant difference in the bony size of the fatter and the leaner infants.

By contrast, the muscle diameter of the calf did not show statistically significant superiority of the fatter infants at any age. There is a tendency in this direction at the ages of one and three months, especially in girls, but in older infants, the trend is reversed. Again, this reversal is more definite in the females. At nine and twelve months, the *leaner* girls tend to have *larger* leg muscles. When a group of infants is followed for a year, the initial superiority of the fat infants in length and muscle development disappears. Thus, the amount of subcutaneous fat (at one month), considered as an index of "nutritional status," has little prognostic value in regard to the subsequent growth progress during infancy.

The authors' comment on the importance of the level of maturity ("physiological age") in interpreting the significance of subcutaneous fat deserves emphasis. They note that at one month of age, 10 mm. of leg fat are meager for developmentally advanced babies and generous for physiologically younger infants. The same thickness of trochanteric fat would be indicative of obesity in a late maturing twelve-year-old girl and would represent leanness in a sexually mature girl of the same age (18).

The largest amount of data on the medical significance of departure from "standard" weight (for age, sex, and height) is provided by the life insurance records. The history of height-weight tables and of the extensive experience on "body build" and mortality was reviewed by Marks (19), with emphasis on the penalties of overweight.

While some exploratory studies on a more comprehensive characterization of body build in life insurance applicants have been made, the bulk of the evidence is limited to underweight-overweight present at the time the individual is applying for a policy. There are several other limitations, inherent in the life insurance records, including absence of information on the changes in weight during subsequent years and on the life-long health experience. Kurlander, Abraham, and Rion (20) attempted to test the relative value of different methods of characterizing underweight-overweight and leanness-fatness. The four criteria included: gross body weight, departure from "standard" weight using height-weight standards, as well as the Pryor width-weight standards, and skinfold measurements. Prevalence of heart disease in the the "obese" and normal or thin individuals, identified in terms of the above four criteria, was examined. In Negro women the difference in the prevalence of heart disease was small, and about the same relationship between heart disease and "obesity" was observed using either gross

weight or skinfold measurements. In Negro "overweight" men, heart disease was twice as frequent as among the normal-weight or thin individuals. On the other hand, "fat" individuals identified on the basis of skinfold measurements did not differ in the prevalence of heart disease from the controls. The authors interpret this finding as implicating other components of body weight than fat in the development of heart disease.

The study must be regarded as strictly exploratory. For one reason, the number of subjects, especially men who were not aware of their heart disease prior to the examination, was very small. Nevertheless, it stresses the need for a more precise evaluation of the role of "body build" and "nutritional status" in the etiology of degenerative diseases which account for the overwhelming majority of deaths among American adults.

Summary

In recent years substantial progress has been made in "nutritional anthropometry" in terms of methods, norms, and, to a lesser extent, in the clarification of the biologic significance of the differences in the somatic aspects of nutritional status. Nevertheless, important gaps remain that must be filled by further research while the available knowledge is being put into practical use in nutrition surveys, in schools, in physicians' offices, and in medical clinics.

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Low-Salt Diets for Reducing?

The value of low-salt diets for reducing was the subject of discussion at a session of the Newspaper Food Editors Conference held in Chicago last year. Speakers for this meeting were Dr. G. E. Wakerlin, Department of Physiology, University of Illinois College of Medicine, and Dr. Wright Adams, Department of Medicine, University of Chicago.

The question was: "I have noticed that a number of physicians recommended low-salt diets in connection with reducing for the reason that the water is lost immediately or very shortly and that consequently, the patient on this diet doesn't get so discouraged about losing weight."

Dr. Adams commented that occasionally, a short period of salt restriction may offer encouragement to a person on a reducing diet. "I think that it is never indicated for a long period of time. There is no doubt that if a person is on a reduction diet and is going to lose 20 lb., let us say, that he can go through the period of time when he loses the 20 lb., weighing about 2 lb. less than he otherwise would, if he stays on the salt-restricted diet."

Dr. Wakerlin seconded Dr. Adams' remarks by saying, "I see no reason for having the patient operate on false premises. I think the physician who places the patient on a low-salt diet for a while in the beginning of his restricted caloric diet is certainly not benefiting the patient in any way. I think if it is explained that it takes time to lose weight on the restricted caloric intake, if the patient is an intelligent person (and I think most patients going to doctors for that purpose are intelligent), he doesn't need the added boost. If the physician were to explain the falsity of the temporary reduction in weight that comes from the low-salt diet, I think the patient would prefer to be on the normal salt diet."

Editorial

New Mead Johnson Graduate Awards in Dietetics Announced

Beginning in 1957, Mead Johnson & Company, Evansville, Indiana, has announced that it will make available $5000 annually to The American Dietetic Association for post-graduate educational awards. Formal announcement of this new program of awards was made at the Annual Banquet of the Association on October 11, by Martha L. Wessner, Supervisor of Dietetic Services for Mead Johnson. She said:

It gives me great pleasure to announce that Mead Johnson & Company has made available to The American Dietetic Association an annual grant of $5000 to be used for Mead Johnson Graduate Training Awards of The American Dietetic Association. The objective of this graduate training program will be to produce better professional personnel, thus enabling the medical and allied professions to render even better professional service to the public than it has in the past.

Certain basic principles have been followed in the development of graduate training programs whose funds are provided by Mead Johnson & Company. First, the role of Mead Johnson & Company has been clearly limited to that of providing funds and consultative help. Although the Company served in an advisory capacity in devising the programs, details in every instance have been worked out by the implementing organization. This principle has tended to make the programs more practical and better adapted to the needs of the specialty involved and, at the same time, increased the enthusiasm of the implementing organization, resulting in more effective programs.

Second, the method of choice and the actual determination of the recipients of the awards has been carried out entirely by the implementing organization without pressure or influence from Mead Johnson & Company. Thus, responsibility for choosing or not choosing given individuals has rested squarely where it belongs—with the specialty organization.

A third basic principle has been inherent in the program from the start. Recipients of awards are under no obligation, implied or direct, to Mead Johnson & Company. While the awards are primarily for individuals intending to practice in the field for which the award is made, individuals are not bound, legally or morally, to so practice if their plans change.

We of Mead Johnson & Company are looking forward to progressive friendship with the members of The American Dietetic Association.

As chairman of the Awards, Scholarship, and Loan Fund Board of The American Dietetic Association, Dr. Helen Hunscher reported, following Miss Wessner's announcement, that the Board has recommended that the $5000 each year be divided to provide two fellowships of $1000 each for advanced graduate study and six $500 scholarships for dietetic internships. The policies of these fellowships and scholarships have been written and approved and will be published in an early issue of the JOURNAL. The first awards will be made in 1957.

Mary I. Barber Receives Copher Award

Mary I. Barber has been named the recipient of the Marjorie Hulsizer Copher Award for 1956, the highest award of The American Dietetic Association. The Copher Award is an honor bestowed each year on a distinguished member of the dietetic profession at the Annual Banquet of the Association. This year, presentation was made by Dr. Frank R. Bradley, Director, Barnes Hospital, St. Louis, on October 11 in Milwaukee. Dr. Bradley said:

The Marjorie Hulsizer Copher Award—the highest award for distinguished service in the field of dietetics—takes into consideration that the profession of dietetics is both a science and an art. It is with the art that we should like to deal here. With your permission, I should like to read to you Mrs. Copher's philosophy on the art of dietary administration.[1]

"Administration may be defined as the conduct of any office or employment. Applied to the dietary department of a hospital, it would mean the forming of an organization and the making it function efficiently. There must be no friction, the wheels must move smoothly. The oil must be applied by the executive or chief dietitian.

"Departments set in motion for the first time often find imperfections in the working out of the new system. This does not always mean that there are any fundamental errors in its construction. To a discerning chief, the cause of the difficulty is quite obvious. With the pragmatists she can believe that if it does not work it is not true and try another plan. In fact, several may be attempted before the one that fits is discovered. To seasoned veterans in executive work, a slight hitch in the running of the department has no appalling significance. Self-confidence has been attained by many years of wise control and experience. A little attention and thought is brought to bear on the weak spot, a new arrangement tried and the wheels run smoothly.

"The beginner in the executive field cannot approach her problem with complete tranquility of mind. No matter what your state of mind or how much you tremble inwardly over situations, never give the appearance of being nonplussed. Keep your chin in the air, think your way out with apparent sang froid. It is a good rule.

"The philosopher who said that those whom the gods wish to destroy they first make angry uttered another guide for administrators. Anger impairs straight thinking. It breeds lack of respect. It adds fuel to flame and in the conflagration one's control of the situation goes up in smoke. Likewise, a soft answer turneth away wrath. A suave voice, tones which are the quintessence of politeness disarm. It seems to me that it is quite fair to say—Never lose your

[1] COPHER, M. H.: The administration of a hospital dietary department. 1. The dietitian. J. Am. Dietet. A. 1: 60, 1925.

temper unless you do it to produce a desired effect and have with cool head planned the explosion.

"Cheerfulness that penetrates to every nook of one's department, a spontaneous radiation of one's inward peace of mind and contentment produces a similar state in one's personnel. Laugh and the world laughs with you.

"Persons of naturally happy temperament, of sanguine disposition, confirmed optimists, are often people of abundant energy, vitality and health. If in any work strength and health and energy are necessary qualifications then ten times more are they essential for the administrative dietitian. Students who contemplate becoming dietitians should feel sure that they have the mental attitude and constitution that strain and worry cannot destroy. For no matter how perfect one's organization, or how smoothly it runs, there are times when no power can avert the contretemps.

"The ability to deal with situations competently comes with experience. Good judgment is formed by mistakes. It is infinitely better in most cases to meet a condition with an error of judgment than not to attempt to meet it at all. Beginners are apt to be discouraged by their mistakes, but it is these same mistakes that can be turned into guide posts which blaze the later trial with signs of do's and don'ts. Courage to remedy one's mistakes, courage to meet disappointments, courage to endure criticism stoically, is part of the armor of a dietitian.

"Tact is another qualification without which the administrator is seriously handicapped. Of some people it can be said that they are so tactful, they are liars. Carrying the art too far is not to be desired from the point of view of character. But the instinctive knowledge of how to deal with people without giving offense is certainly an art well worth cultivating. The sensitive mental perception which avoids weaknesses and recognizes assets in contact with others makes just the difference between a gauche and a graceful personality. Queen Elizabeth's [I] political tact was said to be unerring. Most diplomats make their reputation at least in part, by the nicety of their adroitness in meeting the requirements of their problems. Gaining the cooperation of one's own staff, working in connection with other departments, requires an infinite amount of tact.

"Tact is of immense importance but common sense is the balance wheel of life and career. People seem to be born with this qualification. It is not an acquired characteristic. The person whose mental cosmos is not equipped with sane and plain common sense is seriously hampered in business relations. Its lack is easily recognized by others which contributes to the disadvantage of not having it. Fortunately ordinary mortals are usually endowed with a fair amount of common sense. No dietitian is safe without it.

"Perhaps the safety valve most indispensable to executives is a sense of humor. The ability to see the funny side of hospital tangles often lightens the load of disheartening experiences which seem to accumulate only to burst with unexpected suddenness.

"In addition to the foregoing qualities, the ideal administrative dietitian has a sound educational background. Her knowledge of the science of nutrition should be extensive. She should be alert to the trend of the times, keep up with current investigation and research in her field as well as allied fields, and be interested in her profession helping to promote its aims and standards. Her familiarity with history, art, literature, politics, and education of today and yesterday would be a measure of her capabilities. From this combination comes poise and charm which mark her as a woman of the world, able to meet people gracefully and to handle people efficiently.

"To sum up the salient characteristics which a Hospital Superintendent might require of his administrative dietitian, they are executive ability, savoir faire, self control, cheerfulness, health, energy, good judgment, tact, cooperation, common sense, sense of humor, knowledge of subject matter, and a generally well informed mind. No person could hope to be endowed equally with each quality. Some may be lacking. Some come only with the mellowing influence of years. Some have to be cultivated assiduously. The science of being a success in one's chosen career is the art of living one's life to the utmost."

Mary I. Barber—outstanding dietetian and author in the field of dietetics, a leader in your profession, sound in judgment and possessing the qualities of common sense, initiative, and enthusiasm—you rank high among those who have developed and advanced the science and status of the dietetic profession. It is with great and sincere pleasure that we welcome you to the ranks of those distinguished members of your profession who have received the Marjorie Hulsizer Copher Award in dietetics for your distinguished service in the field of dietetics.

The Marjorie Hulsizer Copher Award which Miss Barber received reads: ". . . A PAST-PRESIDENT OF THE AMERICAN DIETETIC ASSSOCIATION; A TALENTED TEACHER, WRITER, AND SPEAKER; AN AUTHORITY ON FOODS—WHOSE LUMINESCENT PERSONALITY, WARMTH, ENTHUSIASM, AND DEVOTION HAS CULMINATED IN MANY CONTRIBUTIONS TO THE PROFESSION; . . . IN RECOGNITION OF HER INSPIRING SERVICES TO HOME ECONOMICS IN BUSINESS AND DIETETICS; OF HER MERITORIOUS SERVICE TO THE ARMED FORCES AS FOOD CONSULTANT DURING WORLD WAR II; OF HER CONTRIBUTION IN OBTAINING MILITARY RANK FOR ARMY DIETITIANS; OF HER UNSELFISH LEADERSHIP IN COMMUNITY ACTIVITIES, ESPECIALLY IN CIVIL DEFENSE."

Aimee N. Moore Becomes Mary Swartz Rose Fellow

This year, for the eighth time, The American Dietetic Association awarded the Mary Swartz Rose Fellowship, made possible by a grant from the Nutrition Foundation, Inc., to a member for graduate study. This year's Mary Swartz Rose Fellow is Aimee N. Moore, who is working toward a doctorate at Michigan State University. Announcement of the selection and presentation was made by Dr. Helen Hunscher, Chairman of the Awards, Scholarship, and Loan Fund Board at the Annual Banquet in Milwaukee on October 11. She said:

A highlight of the Annual Meeting this year has been the History of Nutrition Luncheon and the program which followed it. The refreshing of memories is valuable in that it gives perspective to present events. Mary Swartz Rose, for whom our Fellowship is named, was another of our members whose life and work have been an inspiration to many in this field—in this country and even throughout the world. She was eager to learn for herself and equally eager to help others learn the field of nutrition.

Mrs. Rose was one of the first of the fine women leaders who studied and searched for the undiscovered facts of nutrition under the leadership of Professor Lafayette B. Mendel at Yale. There, as a young, pretty, humorous, and vivacious student she acquired not only knowledge, but developed a curiosity about the mysteries of nourishing the body at all stages of life, thus carrying on the spirit of her great teacher.

There at Yale, Mrs. Rose did a typically present-day deed, which caused a typically present-day reaction of alarm to some people. She met and fell in love with Anton Rose, who was also a graduate student. Contrary to the worries of the sages, this marriage did not inhibit the research and teaching leadership of the dynamic Mrs. Rose. Perhaps it even gave a certain undefinable foundation for her great life. At least we know that she was a good manager of her home, her family, and her work at Columbia University. She has left in the wake of her life, besides this personal phase, many students to whom she passed much of her knowledge, inspiration, and curiosity to learn more. Also in her wake, we find research papers the results of which have led the way to further work and refinement. And, in this wake, are several books which every student in nutrition in undergraduate years found to be everyday companions. I speak of a few that many probably have on their own book shelves: Rose's *Laboratory Handbook for Dietetics*, Rose's *Foundations of Nutrition*, Rose's *Feeding the Family*, and Rose's *Teaching Nutrition to Boys and Girls*. By these titles alone one can know that Mrs. Rose was not only at home in the high levels of knowledge of her field, but she was able to adapt her learning to reach, with meaning, almost the life span of individuals whom she interested. As President of the American Institute of Nutrition, she conducted the business meetings with such humor that the memories of them will live forever in the minds of those present.

This is a short and inadequate sketch of the leader in nutrition research and teaching whose name we honor in a fellowship of this Association. Although The American Dietetic Association has been attentive to the educational preparation of its members since its beginning in 1917, it initiated a different program in 1947–48. It was a thrill to me as your president that year to read the letter from Dr. Charles Glen King, now Executive Director of the Nutrition Foundation, in which he told us that the Foundation wished to provide an award annually for a member selected by the Association and that it was their wish to honor the name and life of Mary Swartz Rose. The Executive Board of the Association was most grateful and realized at the same time that in accepting and administering this grant, we were embarking on a new educational program for promoting graduate study.

As we have done so many times and have been richly rewarded each time, we turned to Dr. Lillian Storms Coover to write a statement of policy. I shall quote portions of this to you:

"The grant from the Nutrition Foundation, Inc., shall be used to establish and maintain a fellowship to be known as the Mary Swartz Rose Fellowship. It shall be awarded for graduate study and research or research in nutrition and allied fields.

"Qualifications of the persons considered will vary with the field of work. These shall be established by the Committee for each area of work from which candidates are nominated. For example, in the field of research in nutrition, there will need to be evidence of ability to conduct research of a quality acceptable in a field already well established. In the realm of less well established lines of work, as for example, institutional dietetics or public health nutrition, different qualifications will need to be determined.

"It is expected that newer aspects of nutrition or allied fields will receive consideration. For example, a grant might be made to a well trained nutritionist, probably a person having had some experience in the field of teaching at the college level, to complete a medical course in order to prepare for teaching nutrition to medical students. The last category might entail a grant for a longer period of time than one year.

"It is suggested that this fellowship be applied insofar as feasible to the various fields of nutrition, applied nutrition, or related fields, to the end that the grant not be made continuously in the same realm of activity."

It is evident that Dr. Coover stated well a broad basic policy. It is as good today as the day it was written.

In the beginning in 1947–48, a committee was appointed, with a system of continuity in its membership, to administer this award. In the constitutional revision in 1949 of the Association, the Awards, Scholarship, and Loan Fund Board was created to select those who were to be recognized for splendid work done in the profession and to aid those who were seeking greater accomplishments through educational advancement.

This year that Board has chosen one who is seeking advancement for the profession through graduate study in business management. This is an area of our responsibility which many know must hasten to keep up with the nutritional accomplishments of our members. The Board's selection is Aimee N. Moore, who is seeking a degree of Doctor of Philosophy at Michigan State University. Miss Moore has been Associate Professor in the Department of Institution Management, New York State College of Home Economics, Cornell University, Ithaca. She holds a bachelor's degree from Women's College of the University of North Carolina and a master's degree from Teachers College, Columbia University. She had a dietetic internship at the University of Michigan Hospital and was a hospital dietitian for five years before entering the field of college teaching.

Miss Moore feels strongly that a hospital dietitian must be a competent business executive as well as a scientist if she is to maintain a position of authority in the administration of a hospital dietary department.

Lydia J. Roberts Essay Award Goes to Dr. Floy Eugenia Whitehead

At the Annual Banquet of The American Dietetic Association on October 11, 1956, the fifth Lydia J. Roberts Essay Award was presented to Dr. Floy Eugenia Whitehead, Professor and Chairman, Department of Home Economics, State University of Iowa, Iowa City. Dr. Whitehead received a $500 honorarium for her essay, "The History of Nutrition Education Programs for Children in the United States." Honorable mention was also accorded in the competition to Dorothy Kern Heyliger of Los Angeles for her essay on the same topic. Presentation of the award to Dr. Whitehead was made by Dan F. Gerber, President, Gerber Products Company, Fremont, Michigan, the firm which has made possible this essay competition by grants to The American Dietetic Association for this purpose. He said:

I am honored to be here tonight to make the fifth presentation of the Lydia J. Roberts Essay Award. The first award was made by Lillian Storms Coover, who incidentally was the person most responsible for the commitment to The American Dietetic Association by our company. If Lillian were here tonight, I certainly would ask her what I should say but, of course, that is impossible, so I'll do the next best thing and quote a part of the talk that she made in October of 1952.[1]

[1] COOVER, L. S.: Felisa J. Bracken wins Lydia J. Roberts Essay Award. J. Am. Dietet. A. 28: 1152, 1952.

"The Lydia J. Roberts Award gives The American Dietetic Association an opportunity to stimulate its members to make investigation of some phase of history of nutrition and submit an essay in a contest. Such an incentive to do something interesting seems to be necessary, or we just never 'get around to' doing the extra research, the cultural study which has compensations and makes the additional study worth while.

"The Gerber Products Company has given the Association a grant of $500 for each of five years, with which it was decided to establish an annual award for an essay in the field of history of nutrition. It also provided an opportunity for the Association to honor one of its outstanding members —Lydia J. Roberts—after whom the Essay Award has been named. Dr. Roberts' work and publications in the field of nutrition of children made the naming of this contest a natural choice."

This year's winner is Dr. Floy Eugenia Whitehead, Professor and Chairman of the Department of Home Economics, State University of Iowa, Iowa City, Iowa. Dr. Whitehead was born in Athens, Georgia. She graduated from the University of Georgia with the Bachelor of Science in Home Economics degree and later with the Master of Science in Education. She has also studied with Lydia J. Roberts and staff at the University of Chicago, and, in 1951, received the Doctor of Science degree from Harvard University. She was a member of the staff of the Department of Nutrition, Harvard School of Public Health 1949–1952 as Research Fellow and continued work with that group from 1952–1954 as Visiting Lecturer in Nutrition Education.

Dr. Whitehead has also taught home economics in Georgia high schools; was Assistant Professor of Home Economics at West Georgia College; served as Associate Director of Health Education, Georgia State Department of Public Health; conducted research as Associate Professor of Home Economics at Louisiana State University; and taught at Mississippi State College. She was Director of Nutrition, The Wheat Flour Institute, Chicago, from 1952 to 1953; Director of Nutrition Education, the National Dairy Council, Chicago, 1953 to 1955, and continued her studies in nutrition education as co-director of a project in Kansas City, Missouri, public schools from 1952 to 1955.

This is most impressive record, but just as impressive is the following quotation from a letter to Edna Mae McIntosh of our company from Dr. Fredrick J. Stare of the Harvard University School of Public Health.

"Perhaps one item of human interest is Eugenia's sincere and unusual enthusiasm for nutrition and its importance in public health. This is certainly one of her outstanding characteristics and qualities. She speaks to a lay audience with the fervor of an evangelist or a good Baptist preacher, and I am sure that many in her audiences go away really feeling that next to God and country, nutrition is the most important thing in their lives. Of course, maybe it is. She has a great force of personality and character and is able to impart these aspects to her audience."

Researchers Produce Lipoprotein Deposits in Rats

Fatty deposits characteristic of early atherosclerosis have been produced by Public Health Service scientists in the hearts and arteries of rats, a species naturally immune to this disease. This has been accomplished by injecting the rats with human lipoproteins, the large fat-protein molecules in which form the body transports fats through the blood.

Report of this accomplishment, which further implicates faulty fat transport in the causes of atherosclerosis, was published in the July issue of the *Journal of Laboratory and Clinical Medicine* by Drs. Joseph Bragdon, Edwin Boyles, and Richard Havel of the National Heart Institute, National Institutes of Health, Bethesda, Maryland.

Using the ultracentrifuge, the researchers separated the lipoproteins of pooled human serum into four classes or "fractions," on the basis of density. Fraction 1, the class of lowest density, concentrated on the surface of the test tube as a solid buttery layer, when subjected to 9,500 gravities for 10 min. After the "butter" was removed, the addition of salt water and application of 105,000 gravities for 22 hr. produced Fraction 2 as a fluid "butter-and-cream" layer. More salt added to the balance of the serum and the application of 105,000 gravities for another 22 hr. concentrated Fraction 3, a thin orange-yellow layer. Fraction 4, the class of highest density, required more salts and 48 hr. rotation at 105,000 gravities to appear at the surface as a thin, faintly yellow layer.

Samples of each fraction were injected into the tail veins of forty-three male rats. Five hours later they were killed, and the hearts, arteries, and blood serum were examined for effects of the injections. The rats receiving Fractions 1, 2, and 3—the low-density lipoproteins—showed abnormal deposits of fatty material on the valves and inner linings of the hearts and in the coronary arteries. Fraction 4 produced no such abnormalities.

The injection of the low-density molecules also caused the appearance in rat serum of those of the highest density. This was anticipated, because the reduction of the larger molecules to the more compact high-density ones is thought to be a normal part of fat metabolism. More surprising, however, was an elevation of low-density lipoproteins following injection of the higher density molecules. The authors theorize that abnormal quantities of the high density material may have blocked the natural mechanism for removing those of lower density.

The lipoproteins of low density (Fractions 1, 2, and 3) are thought to be implicated in atherosclerosis. The blood plasma of men generally contains a higher proportion of these fractions than that of women, and nearly twice as many men as women die of atherosclerotic heart disease. Sufferers from nephrosis, diabetes, and other diseases which are conducive to atherosclerosis also have relatively greater proportions of the low-density fractions than normal persons.

Current Comment

An Advisory Committee Considers Dietetic Problems in a Psychiatric Hospital

ALLEN E. HUSSAR, M.D., *and* JEAN E. STURDEVANT

Chief, Medical Service, and Chief, Dietetic Service, Veterans Administration Hospital, Montrose, New York

In the general hospital, the magnitude of dietetic problems usually depends on the number of patients requiring therapeutic diets. In a psychiatric hospital, additional problems are created by aberrant eating habits of the mentally ill patients. Characteristic eating problems of patients in psychiatric hospitals fall into three categories: inadequate food intake, excessive food intake, and failure to adhere to modified diets.

Of course, not every psychiatric patient presents a dietetic problem; on the other hand, some create more than one. Special measures are needed to detect the problem cases. These measures further increase the burden of those responsible for the proper nutrition of the large patient population.

The solution to dietetic problems in a psychiatric hospital often requires the teamwork of the Dietetic Service, the medical staff, the Nursing Service, Special Services, and others. Obviously, a forum is necessary to coordinate such teamwork. To fulfill this need, a Medical Advisory Committee to the Dietetic Service was recently created in our hospital, with the Chiefs of Medical, Surgical, Tuberculosis, Continuous Treatment, and Dietetic Services as regular members. Representatives of the Nursing, Canteen, Special, and other Services have been invited to attend as needed by the subject under discussion. The committee meets whenever several problems have accumulated.

Most recommendations and comments in this paper are the outgrowth of these meetings.

The committee's authority is purely advisory. Its findings and recommendations are submitted to the Director of Professional Services for appropriate action. We feel that the function of this committee is of great help in promoting the best nutritional care with the maximal efficiency.

Inadequate Food Intake

Malnutrition without underlying physicial illness is commonly seen in psychiatric wards. Since it is much easier to correct undernourished states in the early stages, inadequate food intake of patients should be promptly noted. There are three steps through which this may be discovered.

First, nursing personnel on duty in the dining rooms should observe closely whether the patients consume all or the major portion of the nourishment served. Those who eat 50 per cent or less of a meal should be reported to the ward physician.

Second, inadequate eaters who are reported more than once during a short period of time should be investigated as to their average food intake and whether refusal to eat is constant, periodical, limited to a particular meal, a particular dish, or follows a pattern. If the patient is in good or fairly good contact with reality, a nutritional history taken by the dietitian will usually provide the answer to these questions. In patients who are disoriented, a so-called nutritional check sheet may furnish valuable information. This form, which is illustrated on page 1190, is initiated by order of the physician and carried on as long as necessary to obtain the desired information. For diagnosis, a four- to five-day period is usually satisfactory. This form is also helpful in determining the results of corrective measures and may be used until the patient's intake has been corrected.

Third, patients should be weighed at regular intervals (once a month is usually satisfactory), and the ward physician should keep a close eye on the weight charts. Patients who eat poorly and who for some reason have previously escaped detection may be discovered through the weight charts.

To correct insufficient food intake successfully, it is necessary to find out why the patient is eating poorly. First of all, any underlying physical illness must be ruled out. It is worth mention here that close observation of eating habits is an excellent measure to discover medical or surgical diseases in mentally ill patients. Psychotic patients frequently do not complain of somatic symptoms. Anorexia and weight loss are common symptoms of many diseases and may lead to discovery of physical illness in a mute, negativistic, withdrawn, or deteriorated psychotic patient.

If physical illness can be ruled out, the cause of inadequate food intake should be investigated further. Of course, the patient's mental status will be responsible for this defect in most cases and, therefore, correction will fall in the realm of psychiatry. However, the Dietetic Service may be of much help to the psychiatrist in this problem. The dietitian may find the solution to a given difficulty after an interview with both the patient and nursing personnel. Such interviews will produce a nutritional

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Iron	4.46 mg.	1.5 mg.
Calcium	.58 gm.	.31 gm.
Phosphorus	.46 gm.	.33 gm.
Vitamin A	2380 I.U.	940 I.U.
Thiamine	.77 mg.	.14 mg.
Riboflavin	1.64 mg.	.56 mg.
Ascorbic Acid	25.7 mg.	3.0 mg.
Vitamin D	161 I.U.	31 I.U.
Cholesterol	38.4 mg.	299 mg.
Calories	270	291 mg.

*Eggnog nutritive value from Bowes & Church, 7th Ed. 1951

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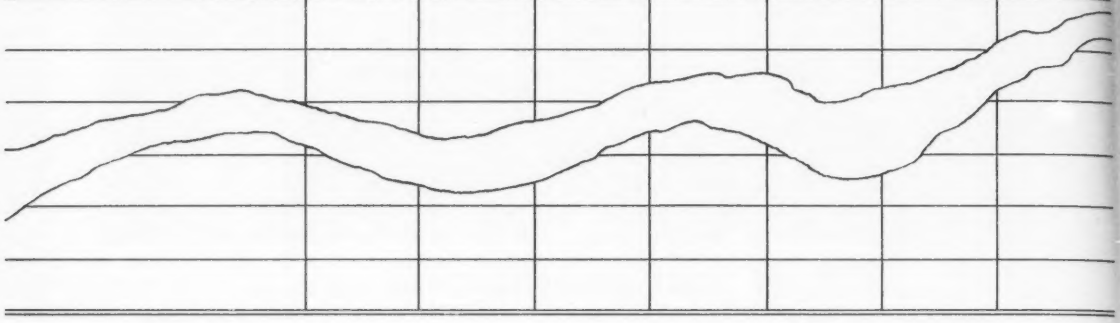
Form used in nutritional history of disorientated patients

UNIT		PERIOD COVERED

NUTRITIONAL CHECK LIST

DATE	BREAKFAST	DINNER	SUPPER	FOOD BETWEEN MEALS	BEDTIME MEAL	VOMITING	



NAME _____ WARD _____

INSTRUCTIONS:

1. No exact measuring, but only rough estimate, is necessary in determining the amount of food patient consumes.
2. Put down figure 100 if patient ate nearly everything that was served to him.
   Put down figure 75 if patient ate three-fourths of the food served to him.
   Put down 50 if patient ate half of food served to him.
   Put down 25 if patient ate only very little of the food served to him.
   Put down zero if patient ate nothing of the food served to him.
3. Under "vomiting" mark only the hour of the day when the patient vomits.
4. Initial your recording in the corner of the square.

history of the patient with eating problems, revealing quantitative and qualitative defects in food intake, as well as the reasons behind them. A few examples may illustrate the value of this practice.

Catering to Patients Can Increase Intake

The Dietetic Service in our hospital found that some patients did not eat spaghetti dishes for the sole reason that they could not handle the spaghetti. Others left cream, butter, jelly or sirup on their plates because they did not know what to do with them. Substitution of a similar type dish served in a form which is more easily handled, adding cream and sugar to cereal prior to service, putting butter and jam on bread, and pouring a sirup which includes butter on hot cakes will insure patients eating these foods and their having the planned dietary intake. It is not uncommon to see patients with aversion to certain foods. Substitution within possible limits, i.e., serving cheese and eggs to those who refuse to eat meat, will bring the desired result.

It has been found that some patients could not adjust themselves to the hospital meal service because of long-standing food habits, as for instance, failure to eat breakfast, or the habit of eating a heavy meal late in the evening because the patient formerly worked on a midnight shift. These patients need re-education. However, if such a program is impossible, some modifications in the meals served will improve their dietary intake. One of our Chinese patients refused all meals. A dietetic interview revealed that he would be willing to eat if he could pour an egg into a cup of hot water every morning. He was allowed to have it and from then on the patient ate all the food served to him.

Most patients with feeding problems eat much

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better when assisted. The hospital volunteer workers can be of tremendous help in this difficulty. Volunteers can open milk containers or straws, cut the meat, give a word of encouragement, or otherwise show that touch of interest "from someone who cares." Efforts should be made to obtain enough volunteers to assist at meals. Unfortunately, our volunteers are available only at noon and not for the other two meals when their service would also be of much value. There are always patients in a psychiatric hospital who, because of their refusal to eat, require tube feeding to prevent starvation. With individualized care, the patients requiring tube feeding might be substantially reduced.

It is common hospital practice to prescribe between-meal nourishment for patients who eat their main meals poorly. This is hardly the solution to the problem since it does not maintain or correct the nutritional status of poorly-eating psychotic patients. Food intake by most of these patients can be improved beyond the caloric value of supplemental nourishment by the previously mentioned measures, namely, special attention to the patient's problems by the psychiatrist and dietitian and feeding assistance by nursing or volunteer personnel.

Overeating

Prevention and treatment of obesity in psychotic patients is another dietetic problem in mental hospitals. Again, the early detection of excessive weight gain makes handling of this problem much easier than when obesity is far advanced. Observation of the weight chart and the recognition of any substantial increase in weight by the ward physician is a satisfactory screening method for detection of overeating.

Of course, an unusual increase in weight must first be investigated for causes other than excessive food intake. Thereafter, the weight chart may lead to discovery of cardiac failure, liver or renal disease by recording weight gain from edema.

The regular hospital diet rarely, if ever, produces obesity. Extra nourishment, however, is easily available to the patients because of gifts from visitors and trips to the Canteen. Also, obese patients frequently take food from other patients' trays. The first step, therefore, in correcting overweight is to prevent the patient eating in the dining room more than is served to him, receiving food from visitors, and/or eating in the Canteen. The latter may be accomplished by withholding canteen books from privileged patients, while non-privileged patients can be watched by the aides attending them in the Canteen. If these measures are ineffective, the obese patient should be transferred to the Medical Service for dietary weight reduction.

Failure to Adhere to Modified Diets

The prolonged administration of modified diets to psychiatric patients for ulcer, diabetes, renal and cardiac disease, and so on is a problem in itself in a large mental hospital. If patients refuse to adhere to their diet, the problem becomes multiplied.

These patients must, of course, be watched closely during their meals, and precautions taken to prevent their receiving food parcels and eating in the Canteen. As in the case of obesity, privileged patients on modified diets should not be given a canteen book, and non-privileged patients should be watched by aides while in the Canteen. The aides accompanying patients to the Canteen should be furnished with a list of those who are not allowed to buy food there. An alternative would be to mark the canteen books of these patients.

It should be mentioned here that diabetic patients receiving insulin should not be given ground privileges which permit them to walk around by themselves, since it is difficult to teach these patients the symptoms and management of insulin reaction. Finally, if a diabetic patient who receives insulin refuses to eat a meal or a substantial portion of it, the uneaten carbohydrate should be replaced by fruit juice or, if necessary, by parenteral glucose.

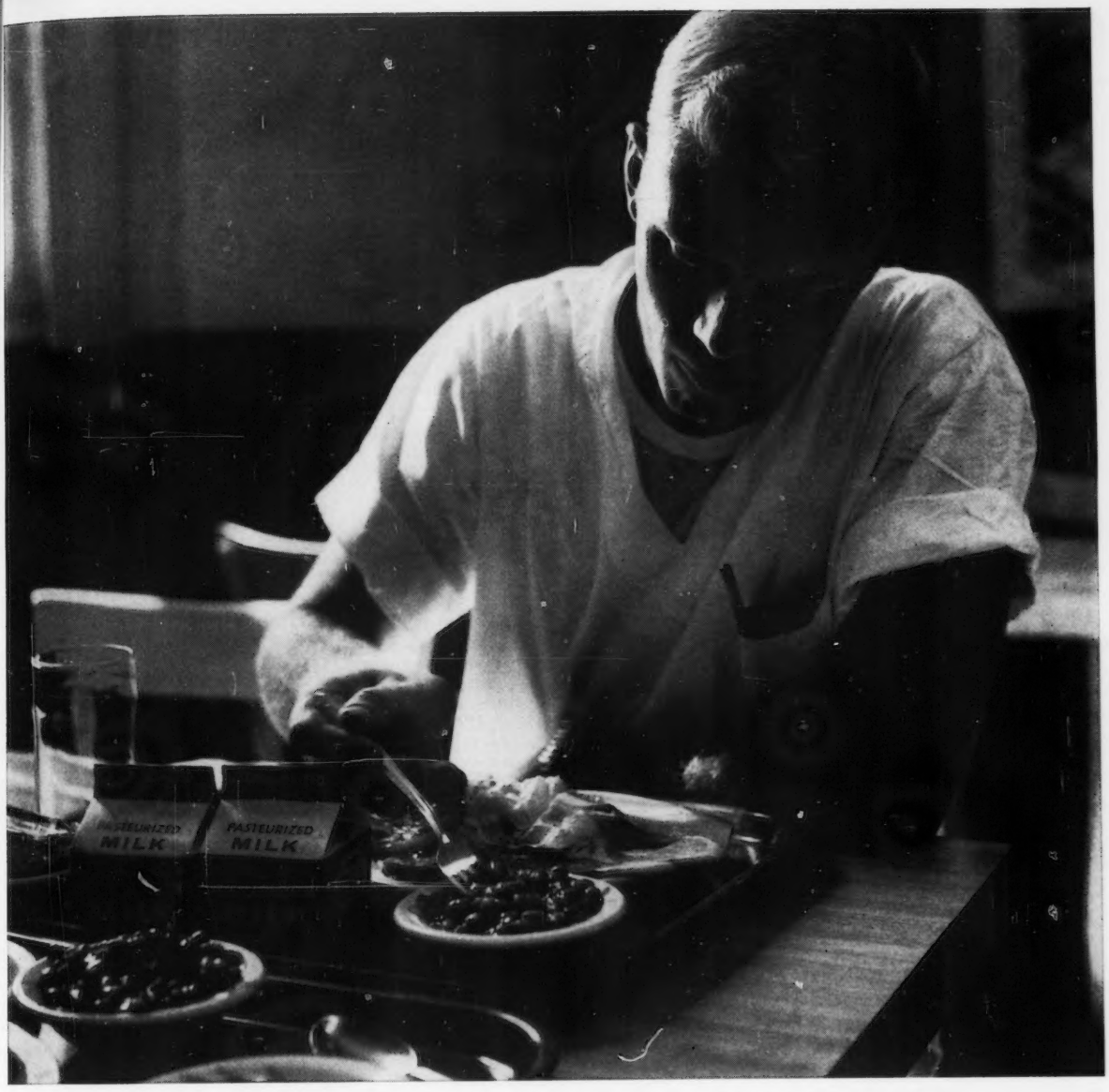
Miscellaneous Problems

In addition to the foregoing major problems, the Medical Advisory Committee has discussed several other topics and suggestions raised by the various services. It may be of interest to quote a few:

The Committee called the physician's attention to: (a) indiscriminate prescription of special diets; (b) the common error of forgetting to discontinue modified diets when no longer indicated; (c) the erroneous practice of prescribing high caloric diets for patients who cannot even consume a regular diet; (d) the more effective and economical prescription of vitamin preparations (if needed) rather than high-vitamin diets; (e) the use of plain water instead of fruit juices or milk, for the purpose of forcing fluid intake; (f) the unnecessary burden on the Dietetic Service to prepare "1400-calorie" or "600-mg. sodium" diets when the hospital diet manual contains 1200- and 1500-calorie diets, and 400- and 800-mg. sodium diets, respectively.

On recommendation of the Committee, the Dietetic Service gave lectures with demonstrations to the medical staff. Recently, the Canteen Service suggested delivery of evening snacks to the wards for those who desire and are permitted such meals. The Committee is now considering this subject.

It is important to recognize that food service in a psychiatric hospital should not be different from that for any other group. No concession should be made in quality, appearance, palatability, and variety just because the food is served to mentally ill patients. The erroneous attitude that often says "you can't do that in a mental hospital" should be avoided. With some additional effort, mental hospitals, too, can provide good nutritional care.



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Current Literature

Contributed by Janette C. Carlsen and Ethel M. Miller, The Johns Hopkins Hospital, Baltimore; Elizabeth H. Tuft, Chicago Wesley Memorial Hospital, Chicago; and the Journal staff

THE AMERICAN JOURNAL OF CLINICAL NUTRITION

Vol. 4, September–October, 1956

*The effects of diet on renal function in healthy men F. Sargent and R. E. Johnson.—p. 466.
*Nutritional aspects of acute glomerulonephritis. H. J. Zimmerman.—p. 482.
Dietary treatment in acute anuria. K. G. Lowe and H. Valtin.—p. 486.
*Nutrition in chronic renal failure. A. J. Merrill.—p. 497.
*Nutrition and the nephrotic syndrome in adults. J. R. Squire.—p. 509.
Kaliopenic nephropathy. J. W. Conn and R. D. Johnson.—p. 523.
Renal lesions in kwashiorkor. J. N. P. Davies.—p. 539.
Observations on the renal defense of body composition in children. J. Metcoff.—p. 543.
*Calcium and the kidney. D. S. Kushner.—p. 561.

Diet and Kidney Function in Healthy Men. In these experiments, all possible combinations of water, salt, and protein deprivation were used. Nutritional imbalance, exposure to cold, or hard work are said to produce ketonuria. Glycosuria is said to be extremely rare. Unbalanced diet or vigorous exercise were noted to produce transient albuminuria. Exposure to cold accentuated it. Microscopic hematuria and cylindruria may also be produced by unbalanced diets, especially those of pure carbohydrate or starvation. They may also be accentuated, when a predisposition is present, by moderate exercise.

Nutrition and Nephritis. There have been a few attempts to evaluate the importance of dietary protein in treatment of nephritis by controlled studies in humans. The acute disease involves both kidneys diffusely with apparently complete recovery in most cases. Chronic nephritis in adults seems to result more frequently with only from 60 to 80 per cent recovery. Implicit in diet therapy has been the aim to minimize the requirements for excretory function by the kidney. In his studies, Addis has re-emphasized the importance of rest. The article points out that Addis was able to calculate that over three-fourths of the theoretical osmotic work of the kidney was related to the excretion of urea. Since urea excretion increases with increased protein intake, he suggested that the work of the kidney could be directly related to the amount of protein ingested. The contention is supported by a series of experiments showing that the size of the rat kidney increases as the protein intake increases.

Nutrition and Chronic Kidney Failure. The duration of chronic kidney failure requires that the diet be adequate in caloric, vitamin, mineral, and protein content, and that it contain proper amounts of the essential amino acids. The food must be palatable, since tube feeding is impractical and bad for patient morale. Since protein end-products are toxic and normally excreted by the kidney, protein catabolism should be minimized. Dehydration should be avoided, as should overhydration, as it may embarrass the heart or cause serious mental and central nervous system manifestations, as well as produce further deteriorations in renal function. Acid salts should be avoided. Attempts should be made to correct acidosis and regulate osmolarity. This should be done gradually. Nutrition should be maintained at a reasonable level. Electrolyte concentrations should be brought to levels conducive to the best kidney function and body economy, with control of undesirable losses. Each of these principles of treatment are discussed in detail in the article.

Nutrition and Nephrotic Syndrome in Adults. Methods for assessing the nutritional status of a typical nephrotic patient are discussed. Dietary requirements include a high consumption of proteins and calories to replenish wasted body tissues. Patient refeeding is discussed, and it is noted that in each interval between the main meals, at least one flavored drink of salt-free milk has to be given so that sufficient protein is received. The effects of cortisone and related compounds on the syndrome are so strikingly beneficial that until a more radical cure is available, large numbers of patients will be receiving the drugs. Investigation is needed on the optimal diet to accompany that treatment. Current experience suggests high-protein, high-calcium diets, but in convalesence a lessening of calories.

Calcium and the Kidney. Principal sources of calcium are milk and its derivatives. Foods containing oxalic or benzoic acids, such as spinach, beet greens, and cranberries, decrease the absorption since the oxalate and benzoate salts are insoluble. A high ratio of phosphorus to calcium in the diet also depresses calcium absorption, because calcium phosphate is less soluble in the presence of an excess of phosphate ion. Calcium, it is stated, is never completely absorbed, regardless of intake. Moreover, in addition to that in food, a considerable contribution to the amount entering the bowel is made by the digestive secretions. In this country, healthy adults are in calcium equilibrium when the intake is 10 mg. per kilogram body weight (0.5 to 0.8 gm. calcium) daily. This study also discusses renal mechanisms for calcium excretion, calcific renal injury, and states of altered calcium metabolism as an indirect consequence of disordered renal excretory mechanisms.

AMERICAN JOURNAL OF MEDICINE

Vol. 21, September, 1956

*Insulin I-131 metabolism in man. G. W. Welsh, III, E. D. Henley, R. H. Williams, and R. W. Cox.—p. 324.
*Stable and brittle diabetes. J. G. Alivisatos and E. P. McCullagh.—p. 344.
*Aggravation of clinical manifestations of folic acid deficiency by small daily doses of vitamin B_{12}. J. W. Harris.—p. 461.

Insulin Metabolism. The action of insulin is closely linked with its metabolic rate in the body and it is, therefore, a matter of some importance to trace its disposition from the time of injection. This can be done conveniently by labeling insulin with I-131. The study reported establishes that the plasma disappearance time of such labeled insulin in plasma is significantly prolonged in subjects who have previously received insulin therapy, whether diabetic or schizophrenic, because of unduly firm binding to a plasma protein perhaps in the nature of an antigen-antibody reaction. The biologic activity and metabolic degradation of insulin consequently are affected. It is suggested that the insulin-binding factor may be an antibody arising secondary to insulin therapy and that its presence may be of therapeutic importance.

Stable and Brittle Diabetic Persons. A classification of diabetes based on the study of 172 patients is presented. An attempt is made to separate persons with stable diabetes from those with brittle diabetes and to express the degree of diabetic control in these patients. The incidence of degenerative complications was higher in patients with stable diabetes, and the incidence of severe diabetic retinopathy in adult patients with brittle diabetes with long-standing diabetes was very low. Patients with stable diabetes with poor control showed a significantly higher incidence of late degenerative complications than those with stable diabetes with good control. Further indications are presented to support the concept, already described in the literature, that there are two types of diabetes mellitus which should be considered as distinct metabolic entities.

Folic Acid Deficiency Aggravated by B_{12}. Two patients are reported, one with Addisonian pernicious anemia and one with nutritional megaloblastic anemia. In both, severe painful glossitis and cheilosis developed during the administration of small doses of vitamin B_{12}. The lesions were promptly reversed to normal on the administration of folic acid. The clinical and hematologic observations made in these patients pro-

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vide additional evidence for the reciprocal relation between vitamin B_{12} and folic acid acting on a metabolic chain that results in the production of nucleic acid throughout various tissues of the body but especially in the hematopoietic tissues.

ANNALS OF BIOCHEMISTRY AND EXPERIMENTAL MEDICINE (India)

Vol. 15, Number 3, 1955

*Riboflavin level of the blood of normal Indian male adults and the effect of administration of large dose of this vitamin on it. H. N. De, P. Datta, Jr., and P. N. Mankad.—p. 137.

*The relation of vitamin B_{12} with thiamin, riboflavin and nicotinic acid. R. V. Bhagwat and K. Sohonie.—p. 161.

Vol. 15, Number 4, 1955

*Effect of the nature and levels of dietary fat on the utilization of vitamin A by albino rats. I. B. Chatterjee.—p. 181.

Studies on the biosynthesis of L-ascorbic acid by the rat: effect of pantothenic acid deficiency on the synthesis stimulated by chloretone. G. C. Chatterjee, S. C. Roy, and B. C. Guha.—p. 191.

Effect of the single deficiency of riboflavin, thiamin and folic acid on the concentration of different phosphate-esters in the liver tissue of rats. G. C. Chatterjee, S. C. Roy, and B. C. Guha.—p. 195.

Blood Riboflavin Levels of Normal Men in India. In this series of experiments, the riboflavin content of the blood of clinically diagnosed normal individuals was investigated. It varied from 48 to 62 mcg. (average 53 mcg.) per 100 cc. whole blood. Administration of 10 mg. riboflavin daily for one week, which brought about the saturation of the tissues with respect to riboflavin, did not have much affect on the blood riboflavin level.

Relation of Vitamin B_{12} with Thiamine, Riboflavin, and Niacin. Working with male albino rats, this study indicated that thiamine has a role in carbohydrate and lipid metabolism. Vitamin B_{12} and thiamine appear to be interrelated. Vitamin A and ascorbic acid are the common factors to which thiamine and vitamin B_{12} seem to be interrelated. The results obtained showed no significant difference in the concentration of niacin in the tissues of control and deficient rats. A reduction in the concentration of vitamin B_{12} did not seem to affect the amount of niacin in the tissues of rat.

Dietary Fat and Vitamin A Liver Storage. Male weanling rats were depleted of vitamin A in an average of four to five weeks. When groundnut (peanut) oil was employed at 5 per cent level, the depletion period was higher than at the 0, 1, and 3 per cent levels. Supplementation by 20 mg. ethyl linoleate per rat per day had no statistically significant influence during the depletion period. At 5 per cent level, groundnut oil, hydrogenated groundnut oil, and coconut oil had similar effects on growth and vitamin A storage. Within the forty-two-day test time, rats receiving 1 or 3 per cent hydrogenated groundnut oil showed no statistically significant growth or liver storage of vitamin A different from those receiving the same fats supplemented by 20 mg. ethyl linoleate per rat per day.

ANNALS OF INTERNAL MEDICINE

Vol. 45, September, 1956

*Adrenal cortical function and the pathogenesis of rheumatoid arthritis. Editorial. H. L. Holley. p. 550.

Adrenal Cortical Function and Rheumatoid Arthritis. Certain clinical characteristics of rheumatoid arthritis and the immediate improvement following the administration of corticotropin and the 11, 17 oxygenated corticoids, have led to the implication of adrenal cortical dysfunction in etiology of this disease. Until recently no laboratory support for this concept was available. Now laboratory data indicate an alteration in the normal diurnal pattern of urinary steroid excretion in rheumatoid arthritis. The decreased excretion of urinary steroid metabolites can be correlated with the early morning exacerbation of muscular stiffness, so characteristic of rheumatoid arthritis. Also, there appears to be increasing evidence that the anterior pituitary, under whose control the adrenal cortex secretes cortisone, may be implicated.

ARCHIVES OF PEDIATRICS

Vol. 73, August, 1956

*Penicillin in fluid milk. C. C. McLean.—p. 276.

Penicillin in Fluid Milk. In two preliminary surveys conducted by the Food and Drug Administration in 1955–56, 11.6 per cent of 474 samples of fluid milk contained penicillin. In the third nationwide survey of 1,706 samples, 5.9 per cent contained penicillin. A discussion of the sample areas is given, and it is recommended that the Food and Drug Law be amended to say that dairy cows producing milk should never be given slow-absorbing penicillin, either by udder infusions or intra-muscularly, and that milk should not be sold to the public from a sick cow receiving penicillin or other antibiotics for at least six days after the last dose.

THE BRITISH JOURNAL OF NUTRITION

Vol. 10, Number 3, 1956

*The nutrition of Nigerian children, with particular reference to their energy requirements. B. M. Nicol.—p. 181.

*Malnutrition in African adults. 3. Effect of diet on body composition. E. G. Holmes, E. R. Jones, M. D. Lyle, and M. W. Stanier.—p. 198.

*Experimental dental caries in the albino rat. The production of carious lesions in animals maintained on a finely powdered purified diet containing 67 per cent sucrose. R. L. Hartles, F. E. Lawton, and G. L. Slack.—p. 234.

*Disappearance of carotene from the alimentary tract of vitamin A-deficient rats. V. H. Booth.—p. 241.

Nutrition of Nigerian Children. This is a report of the health and nutrition of peasant children from different parts of the Nigerian bush. It is compared with a report of the offspring of educated families living in towns. While the consumption of foods is different, both eat well by Nigerian standards. It is suggested that the caloric requirements of the children in their own environment are greater than those suggested by the Food and Agriculture Organization of the United Nations. Neither a relation between gingivitis and dietary ascorbic acid was seen, nor any simple association demonstrated between dental caries and cereal and calcium consumption.

Malnutrition in African Adults. The effects of diet on body composition are outlined. The early experiments led to the suggestion that adult subjects undergoing refeeding after malnutrition showed extreme variations in cell composition and that that may represent a morbid condition. In the last section of the study, it was suggested that the muscle specimens contained less protein than found in normal persons by other workers in other parts of the world; the difference was made up partly by nonprotein solids which may have been chiefly fat and by water.

Experimental Dental Caries in the Albino Rats. The object of the preliminary study was to find out if a caries-susceptible colony could be built up from a few individuals imported from an established susceptible colony. A successful marked degree of caries was produced in the animals after they had been maintained on the high-sugar diet for six months. The stock was from that maintained at the Harvard School of Dental Medicine. All the rats were descendants of four pairs of Harvard animals. The diets were purified diets containing 67 per cent sucrose. The growth, reproduction, and lactation on the diets were good. After 184 days, an average of 2.2 carious teeth per animal was observed.

Carotene in Alimentary Tract of Vitamin A-Deficient Rats. When the food intake of non-deficient rats was restricted to that voluntarily consumed by deficient rats, the percentage disappearance of carotene was much the same in both groups. The enhanced percentage disappearance of vitamin A deficiency is, therefore, probably the result of lowered food intake, which in turn is due to reduced appetite. The lowered food intake might be effective through reduction either of physical bulk or of one or more of the dietary components. The proportions of protein, fat, and dried yeast in the diets of vitamin A-repleted rats were reduced in turn so that each was consumed in approximately the amount consumed by deficient rats. The percentage disappearance of carotene was affected only slightly and irregularly, and it is concluded that the greater disappearance with lowered food intake cannot be linked with reduced intake of protein, fat, or yeast.

BRITISH MEDICAL JOURNAL

No. 4989, August 18, 1956

*Treatment of megaloblastic anaemia of pregnancy and the puerperium with vitamin B_{12}. E. B. Adams.—p. 398.

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H-8

Megaloblastic Anemia of Pregnancy. The results of a clinical trial using vitamin B_{12} in ten patients with megaloblastic anemia of pregnancy are recorded. Response was satisfactory in all seven treated after delivery. It appeared to be as good with doses of 100 mcg. as it was when 1000 mcg. or more was given, but better results are usually obtained with folic acid. Three patients treated before delivery responded poorly. Because of differences in the appearance of the bone marrow and in response to treatment, it seems likely that there are several varieties of megaloblastic anemia associated with pregnancy.

CEREAL SCIENCE TODAY

Vol. 1, September, 1956

Armed forces research leads to new and better packaging of cereal products. A. V. Grundy.—p. 97.

*The use of chlortetracycline-Aureomycin in poultry production. R. White-Stevens, H. G. Zeibel, and N. E. Walker.—p. 101.

Aureomycin in Poultry Production. All experiments were conducted in areas of known endemic diseases, particularly chronic respiratory disease (C.R.D.), the air-sac disease complex, and the nonspecific enteritis disease complex. Also in the area were Newcastle disease, coccidiosis, infectious bronchitis, synovitis, coryza and seasonal laryngotracheitis, and fowl pox. In all cases, appropriate prophylactic measures were used to control these acute diseases. Continuous feeding of Aureomycin at levels of 50 to 200 gm. per ton of total diet produced significant increases in growth, livability, meat yield, quality, and feed conversion. In the C.R.D. cases, there appeared to be a direct action of Aureomycin, with a decline in the severity of the syndrome and its concomitant depression of the growth efficiency of the bird. No effect was found in connection with Newcastle disease, although the secondary infection was reduced. The Aureomycin did not interrupt the normal growth or reproduction or cause any toxic effects.

FOOD AND NUTRITION NOTES AND REVIEWS (Australia)

Vol. 13, March and April, 1956

*Some theoretical and practical aspects of the planning and conduct of tasting tests. E. M. Christie.—p. 21.

Planning and Conducting Tasting Tests. In addition to the organs of taste and smell, other factors such as mouth-feel and temperature, can cause variation in reaction to foods. Food tastes differ at different temperatures. Good shape and color in a food, as a firm red strawberry rather than a squashed pale one, predispose favorable thinking to the taste. Other variables which influence appreciation may be hunger, nausea, indifferent health, memories and association of ideas concerning the foods, prejudice, likes and dislikes, and emotional disturbances. In this study the tasters' booths were completely partitioned from the rest of the room. They were painted neutral gray and had controlled light. There was a food hatch opening into the preparation room which had a stove, double sink, and dishwasher as well as a food warmer. There was also a separate briefing room. To avoid fatigue, no more than two or three tests were given a day, and the scoring systems were based on one through five definitions. Technical points of interest were the use of small cubes of bread which the tasters chewed between samples to remove any lingering traces of bitterness, and the use of orange-colored tumblers to avoid any influence of color on the test item, which in this case was orange juice.

FOOD TECHNOLOGY

Vol. 10, October, 1956

*The role of enzymes in food flavors. E. J. Hewitt, D. A. M. Mackay, K. Konigsbacher, and T. Hasselstrom.—p. 487.

*Organoleptic studies of irradiated foods. G. B. Pratt and O. F. Ecklund.—p. 496.

Enzymes in Food Flavors. Processing food is basically a stabilizing process. Stabilizing is achieved by substantially destroying or inactivating all the enzymes. As far as flavor is concerned, the inactivating of the enzymes has a deleterious effect because many of the flavor components are volatile or heat labile. The contention is presented that it is important to determine what part the flavors of fresh food (enzymatically produced flavors) play in desirable flavors. It has been found that sources of flavor in processed foods can be converted into actual flavor by addition of proper enzymes, the isolation and characterization of which have been tasks of complexity. The "flavorese" enzymes can be obtained from fresh biologic material before processing by the usual enzyme preparation process. An absolutely pure sample of flavorese isn't needed, since a relatively crude enzyme, if it contains a high enough concentration of the desired enzyme, will do. An understanding of these principles can be of great advantage in designing conditions for the commercial processing of foods.

Organoleptic Studies of Irradiated Foods. It has been obvious from the first that the sterilizing of food by high energy radiation may change the flavor and appearance and thus influence acceptance by the military or civilian market. Experiments were made with ground beef, beef tenderloin, pork luncheon meat, cured ham, asparagus, broccoli, Brussels sprouts, cauliflower, peas, and green beans. Statistical analysis of taste test scores showed significant off-flavor in each of the irradiated meats and vegetables. In every case important changes in appearance or flavor developed on storage. Some, but not all, might be attributed to enzymatic action.

JOURNAL OF THE AMERICAN GERIATRICS SOCIETY

Vol. 4, September, 1956

*Multiple serum proteidograms, lipidograms and glucidograms in patients with acute myocardial infarction. O. J. Pollak, W. G. Chubty, I. R. Mazer, and J. S. Evans.—p. 888.

Elpherograms in Acute Infarction. Compared with the elpherograms of healthy persons, those of patients with acute myocardial infarction differ markedly. The proteidogram is characterized by hypoalbuminemia and hyperglobulinemia, the latter caused by a large and constant increase in $alpha_2$-glucoprotein; the increases in $alpha_1$-globulin and beta-globulin can be similarly explained. The increase in beta-globulin might also be due to an increase in the beta-lipoprotein fractions. The decline in albumin is due to a decrease in albumin-alpha-lipoprotein and in the rapid alpha-glucoprotein fraction. Electrophoretic serum studies in patients with acute myocardial infarction have been reported only sporadically. The elpherogram is not diagnostic *per se*, but is a diagnostic aid. Repeated assays are of greater value than a single determination.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

Vol. 162, September 22, 1956

*Salt in the diet. Queries and Minor Notes.—p. 436.

Vol. 162, September 29, 1956

*Current status of aryl sulfonylureas in treatment of diabetes mellitus. R. H. Unger and J. W. Davidson, Jr.—p. 447.

*Cactus leaves and blood sugar. Queries and Minor Notes.—p. 528.

*Excessive fat in certain body areas. Queries and Minor Notes.—p. 528.

Vol. 162, October 6, 1956

Allergy—as it is and as it might be. S. M. Feinberg and A. R. Feinberg.—p. 529.

*Chemical additives. P. E. Johnson.—p. 572.

Salt in the Diet. The average daily intake of sodium of normal adults in this country is estimated to be from 3 to 6 gm. This includes the sodium naturally present in foods and that which is added to foods in the form of salt and other sodium compounds. In *Present Knowledge of Nutrition*, it is stated that the average daily intake of salt is from 10 to 15 gm. Therefore, the intake of sodium from salt added to foods would range from 4 to 6 gm.

Aryl Sulfonylureas in Treatment of Diabetes. A report of the information concerning and the results of clinical trials of tolbutamide (Orinase) in the treatment of diabetes are given. Tolbutamide, an aryl sulfonylurea, is closely related to carbutamide. Comments in the article are that sulfonylureas have no place in the therapy of labile diabetes because of the hypoglycemic reactions when insulin and sulfonylureas are given concomitantly to the patients sensitive to insulin. There is inadequate evidence that therapeutic benefit in the sensitive group ever occurs. The therapeutic activity of the sulfonylureas seems to be limited to stable diabetes.

Cactus Leaves and Blood Sugar. Extracts of plants of various kinds have been reported to have the effect of lowering the blood sugar level. None has the other attributes common to insulin.

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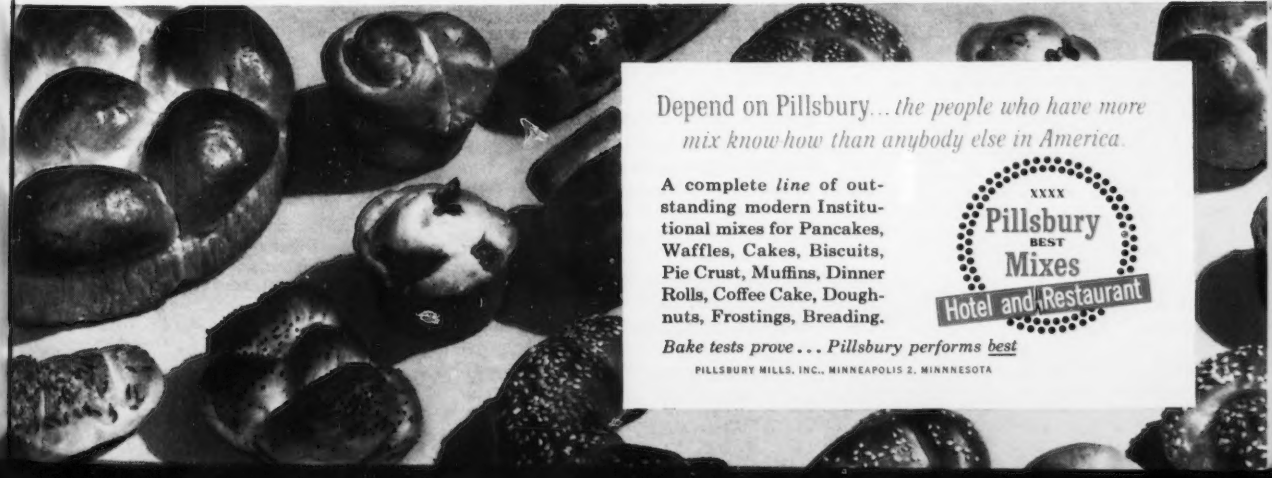

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This question was raised in the case of a woman seventy years old whose diabetes had been controlled by insulin for about three months. She dropped the treatment and used water with cactus leaves. It is commented that her urine would probably have remained sugar-free regardless of the use of the water and cactus leaves.

Chemical Additives. This article is a report of the recent study of the Food Protection Committee of the National Research Council on the use of chemicals in foods for the purpose of evaluating the benefits of the use and the significance of the use in relation to public health. The study was done on chemicals introduced to impart some desired quality. The safety of additives was not the concern of the survey. Some 550 additives, grouped according to function, are listed. The foods in which they are used are given along with levels of use, whenever that information was available. The nutrient supplements, vitamins, and minerals are classified as additives; the non-nutritive sweeteners, saccharin and the cyclamates, are in a separate group. Another group contains additives such as candy polishes and glazes and yeast foods. It is noted that the study presents a realistic and unbiased view of the use of chemicals in food processing.

Excessive Fat in Certain Body Areas. The distribution of adipose tissue depends to a large extent on such factors as endocrine function and the individual's body build, which is determined on a genetic basis. Although exercise is an extremely slow, laborious, and ineffective method of losing weight, it will help the redistribution of adipose tissue to some extent and the maintenance of muscle mass throughout the body during dietary restriction. It would seem likely that, with suitably planned exercises together with only moderate dietary restriction, further fat would be lost from the body without significant change in the face and extremities. Electric massage machines are generally ineffective in weight reducing or in distributing the weight.

JOURNAL OF CLINICAL INVESTIGATION

Vol. 35, August, 1956

*The effect of thyroid disease on calcium metabolism in man. S. M. Krane, G. L. Brownell, J. B. Stanbury, and H. Corrigan.—p. 874.

Vol. 35, September, 1956

*The urinary excretion of sodium and potassium during the pyrogenic reaction in man. W. Lathem.—p. 947.

*Studies on the physiology of hunger. I. The effect of intravenous administration of glucose on gastric hunger contractions in man. A. J. Stunkard and H. G. Wolff.—p. 954.

*The relationship of cardiovascular and renal hemodynamic function to sodium excretion in patients with severe heart disease but without edema. W. Hollander and W. E. Judson.—p. 970.

Calcium Metabolism in Thyroid Disease. Radioactive calcium (Ca^{45}) was given intravenously to patients with hyperthyroidism and myxedema. Euthyroid subjects, patients with Paget's disease of bone, and others with hypoparathyroidism were similarly studied. Several patients were studied before and after appropriate treatment. In four subjects with hyperthyroidism, specific activity of serum and urine declined more rapidly and to lower levels than in euthyroid controls. In contrast, two myxedematous patients demonstrated the least fall in specific activity. After five months' treatment of the myxedema, specific curves declined at the same rate as in the control patients. All of the specific activity curves suggest that they can be analyzed into a series of decreasing exponential functions. It is proposed that each function represents a discrete calcium compartment within the body. Changing thyroid function modifies the size of the calcium compartments and the rate of flow to and from these compartments. Compartment sizes and flow rates are greatest in hyperthyroidism and Paget's disease of bone and least in myxedema. Two of four hyperthyroid subjects were in nitrogen equilibrium, despite which they showed marked urinary and fecal losses of calcium. The findings indicate that bone formation as well as destruction are proceeding at increased rates in thyrotoxicosis.

Electrolyte Excretion in Pyrogenic Reaction. A study was made of the effect of the pyrogenic reaction as elicited by triple typhoid vaccine on the urinary excretion of sodium and potassium in sixteen normal subjects. No systemic change in the excretion of these ions was observed in febrile or afebrile subjects during either the early, transient period of renal vasoconstriction or the late, sustained period of renal hyperemia. A reduction in urinary volume occurred during the vasoconstriction phase in association with a decrement in glomerular filtration rate, and the urine became more concentrated with respect to sodium and potassium ions.

Glucose and Gastric Hunger Contractions. Intravenous administration of 50 ml. of a 50 per cent solution of glucose was followed within 5 min. by the cessation of gastric hunger contractions in nineteen of forty experiments on groups of diabetic and non-diabetic subjects. At 10 and 20 min. following injection, the peripheral capillary-venous glucose differences in the group of nineteen subjects in which contractions were inhibited were significantly higher than those of the group in which contractions persisted. In fourteen of the nineteen experiments in which contractions were inhibited, they returned at an average of 47 min. after injection. Capillary-venous glucose differences at 10 and 20 min. after injection were usually higher than those at the time contractions returned, but this difference was not significant at the 5 per cent level. These findings support the view that metabolic events accompanying increased peripheral removal of glucose have an inhibiting effect on gastric hunger contractions. Events associated with decreased removal, on the other hand, are not a sufficient stimulus for the production of gastric hunger contractions, although they appear to be a necessary precondition.

Sodium Excretion in Severe Heart Disease. Cardiac patients who had many clinical and hemodynamic findings of congestive heart failure but no history of peripheral edema were found to tolerate a moderately high sodium intake without developing edema or salt retention. Many likewise showed no impairment in sodium excretion when infused with 5 per cent saline. The most consistent hemodynamic measurement that differentiated this group from a similar cardiac group with peripheral edema was the finding of a lower right ventricular end diastolic pressure. These findings support the concept that salt retention in congestive heart failure may be initiated primarily by a critical rise in the venous pressure rather than by a decrease in cardiac output or glomerular filtration rate.

JOURNAL OF THE INDIAN MEDICAL ASSOCIATION

Vol. 27, August, 1956

*Gastric response to Indian types of food. J. D. Pathak and M. L. Pai—p. 96.

Gastric Response to Indian Types of Food. Studies were made on healthy young medical students at Baroda. Most of the subjects were vegetarians. Samples were examined for consistency, color, mucus, chlorides, free and total acidity, presence of peptone, reducing agents, starch, fat, and abnormal substances, if any. The fact that some of the subjects were vegetarians did not show any significant relationship with the type of response. The acid response was on an average highest between 1½ to 2¼ hr. and fell 3 hr. after meals. All food, even fatty food, produced some acid secretion. Protein foods evoked higher acid responses, though the degree of acidity was neither proportionate nor parallel with the quantity of protein in the dish. Condiments and spices led to greater acid response, but it was never so high as is generally believed. Whenever any food containing proteins was given, samples showed the presence of peptones within 15 to 30 min., but the protein digestion was incapable of completely digesting to peptone stage even with 3 gm. proteins in any dish. Evidence of the rennin action was obtained in the first samples. Fine curds were aspirated within 15 min. of giving milk. Carbohydrate digestion was very feeble. Starch, when present, was detectable up to the time of evacuation. Fat digestion was not studied, for it has long been recognized to be extremely feeble in the stomach.

THE JOURNAL OF NUTRITION

Vol. 59, July, 1956

*Serum vitamin C of Iowa school children and its relationship to diet and age. C. Roderuck, C. Pudelkewicz, E. H. Jebe, and E. S Eppright. p. 309.

The biological value of oils and fats. IV. The rate of intestinal absorption. H. J. Thomasson.—p. 343.

*The influence of amino acids and other organic compounds on the gastrointestinal absorption

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of calcium[45] and strontium[89] in the rat. R. H. Wasserman, C. L. Comar, and M. M. Nold.—p. 371.

*Digestible energy in relation to food intake and nitrogen retention in the weanling rat. L. R. Sibbald, R. T. Berg, and J. P. Bowland.—p. 385.

*Studies in calcium metabolism. Effect of food phytates on calcium[45] uptake in boys on a moderate calcium breakfast. F. Bronner, R. S. Harris, C. J. Maletskos, and C. E. Benda.—p. 393.

Tryptophan-niacin metabolism in alloxan diabetic rats. E. G. McDaniel, J. M. Hundley, and W. H. Sebrell.—p. 407.

Vol. 59, August, 1956

*The relation of serum cholesterol to the physical measurements and diet of women. L. C. Butler, M. T. Childs, and A. J. Forsythe.—p. 469.

*The effect of radiation sterilization on the nutritive value of foods. I. Biological value of milk and beef proteins. V. C. Metta and B. C. Johnson.—p. 479.

*A comparison of the biological values of dietary protein incorporated in high- and low-fat diets. V. C. Metta and H. H. Mitchell.—p. 501.

A study of blood and urinary vitamin concentrations and of fat balance in the rhesus monkey (*Macaca mulatta*). J. E. Dutra de O., J. G. Coniglio, K. P. Misra, W. N. Pearson, J. A. Efner, and W. J. Darby.—p. 515.

The effects of x-irradiation on the vitamin excretion of the rhesus monkey (*Macaca mulatta*). J. E. Dutra de O., W. N. Pearson, K. P. Misra, G. W. Hudson, and W. J. Darby.—p. 527.

*Utilization of calcium, phosphorus, riboflavin and nitrogen on restricted and supplemented diets. F. A. Schofield, D. E. Williams, E. Morrell, B. B. McDonald, E. Brown, and F. L. MacLeod.—p. 561.

Serum Ascorbic Acid of Iowa Children. The entire sample used in the study of serum concentrations consisted of 705 children from 44 schools. On the day the finger-tips were to be pricked, they ate no fruit for breakfast. Samples were collected within 2 hr. after arrival at school. Seven-day dietary records were obtained for 692 children, serum ascorbic acid concentrations for 655. Decreasing concentrations of serum ascorbic acid (except girls over fourteen years old) and decreasing intakes of ascorbic acid per kilogram body weight were associated with increasing age. From age fifteen the concentration in the blood serum of girls increased, although there was no comparable change in intake. More children over twelve than under twelve were classified as poor or fair according to the categories suggested by Bessey and Lowry.

Amino Acids and Calcium Absorption. It was illustrated that lysine and arginine promote the absorption of radiocalcium and radiostrontium. Other amino acids gave little or no response. Arginine and lysine were equally effective in promoting mineral absorption, although arginine is considered to be only marginally required by the rat for growth as compared to the absolute need for lysine. The article also states that it cannot be conceived that such a non-specific property as the energy provided by the amino acid is primarily responsible for the increased mineral absorption.

Nitrogen and Energy Relationships. The experiment reported was designed to study nitrogen retention and food consumption of weanling rats when two different levels of bulk (Alphacel, a "non-nutritive cellulose") were fed with the nitrogen content maintained at a constant level. Rats receiving the non-nutritive cellulose at 20 and 30 per cent in the rations were influenced by the digestible energy content of the food. Digestible energy consumption has been shown to influence the nitrogen of the weanling rat. As the nitrogen levels for the two rations was the same, it is suggested that for each food nitrogen level there will be an optimal digestible energy level, when nitrogen retention is the criterion of measurement. It will vary according to the quantity and availability of the nitrogen source and with the species and stage of growth of the animal consuming the food.

Food Phytates and Calcium[45] Uptake in Boys. From this study it is concluded that food phytates are of no nutritional concern in this country. Experimentation showed that phytates do not exert a significant effect on calcium[45] absorption when the meal provides 239 mg. calcium and when the phytic phosphorus intake is 80 mg. This is the ratio of a typical diet in this country and hence the food phytates are of no nutritional concern.

Serum Cholesterol in Women. The cholesterol-age trend noted in the present investigation concurs with findings of others who observed that a maximum serum cholesterol value in women occurred between sixty and seventy years of age. Data of this study demonstrated that the maximum occurred a few years earlier. This peak was evinced at approximately forty-five to fifty-five years of age in men. A mean total serum cholesterol concentration of 249 mg. per 100 ml. was observed for 113 women from twenty-six to ninety-two years of age. The average cholesterol content was gradually increased from 207 mg. per 100 ml. to a maximum of 293 mg. per 100 ml. at the mean ages of 27.3 and 54.2 years, respectively. This maximum was maintained during the sixty- and seventy-year period. Then the concentration of cholesterol declined to 239 mg. per 100 ml. at 77.6 years. The ratio of the free to total cholesterol was constant for all age groups. Percentage of dietary fat and protein calories as well as the total energy intake did not show a significant relationship with the variation in total blood cholesterol.

Radiation of Animal Proteins. Irradiation sterilization did not affect the apparent or true digestibility of the beef (100 per cent) or of the milk protein (98 per cent). The biologic value of the beef protein (78 per cent) also was unaffected on irradiation, but the biologic value of the milk proteins (90 per cent) was reduced by 8 per cent on irradiation as compared to a reduction of 6 per cent due to heat sterilization. The possibility of irradiation damage to the sulphur amino acids is discussed.

Dietary Fat and Protein Utilization. Rats were fed test diets so that they received equal amounts of protein, crude fiber, vitamins, minerals, and gross energy, the main difference between the two groups being the fat intake. The low-fat and high-fat diets contained, respectively, 5 and 33 per cent fat, mainly lard. The same effects on protein utilization were found in the protein-depleted and growing rats. The higher fat level did not improve either apparent or true digestibility. Fat did not seem to spare endogenous nitrogen under conditions of satisfactory and equal caloric intake. Indications in one experiment are that a high-carbohydrate diet tends to improve the biologic value of casein in the protein-depleted rat.

Calcium, Phosphorus, and Riboflavin Utilization. This study was designed to determine utilization by the same subjects of calcium, phosphorus, and riboflavin on a diet supplying low levels and on the same diet when intake was raised to recommended levels or above by the addition of either diphosphate calcium and riboflavin or natural foods. Nitrogen utilization was determined throughout the study. In the first year, the restricted diet lacked only milk and milk products; in the second, milk and eggs were omitted; and in the third, milk, eggs, and wheat were lacking. The last diet, which furnished about 300 mg. calcium, 800 mg. phosphorus, and 1.0 to 1.5 mg. riboflavin per day, resulted in a definitely negative calcium balance while mean retentions of phosphorus and riboflavin approached equilibrium. Excretions of riboflavin appeared directly related to intake.

THE NEW ENGLAND JOURNAL OF MEDICINE

Vol. 255, August 30, 1956

*Zinc metabolism in hepatic dysfunction. I. Serum zinc concentrations in Laënnec's cirrhosis and their validation by sequential analysis. B. L. Vallee, W. E. C. Wacher, A. F. Bartholomay, and E. D. Robin.—p. 403.

Zinc Metabolism. The discovery of several zinc dehydrogenases in liver led to the study of zinc metabolism in cirrhosis. Serum zinc concentrations were lowered significantly in patients with cirrhosis of the liver. The concentration of zinc bares a relation to the severity of the disease and its fluctuating course. A group of twenty-eight patients with the stigmas of advanced cirrhosis had a serum zinc concentration of 66 ± 19 mcg. as compared with 120 ± 19 mcg. per 100 ml. for a normal group.

NURSING OUTLOOK

Vol. 4, September, 1956

*Food preparation in the basic nursing curriculum. H. J. Rynbergen.—p. 512.

Food Preparation in Nursing Curriculum. The many changes made in the nursing curriculum have led some nursing educators to question the need for a food preparation course in the already overcrowded nursing curriculum. But before discarding a course of such long standing it may be well to consider its value in the preparation of the nurse. Today, the public demands many services from the nurse in addition to competent care in acute illness. Not the least among the subject areas

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in which she is expected to function effectively is nutrition. It is a difficult task to influence the nutritional patterns of people when the maintenance of good health or the treatment of disease demands a change. However, unless we can skillfully build such changes into the existing food habits of the individual, our teaching will have little effect. If the nurse does not have a sound knowledge of foods and food preparation, her teaching in this area may be surrounded by an aura of unreality which is quickly sensed by the patient, and which may cause him to reject even that teaching which is pertinent to his situation. If the nurse can be taught to evaluate "food on a plate" as it is served in a particular family pattern or situation, and if she is taught to suggest needed changes within that pattern, she is learning to apply the science of nutrition to a practical situation. It is possible that the content and the orientation of the course in food and food preparation needs reconsideration. Basic principles underlying all cooking methods should continue to be emphasized. Some of the actual food preparation, however, could easily deal with the cooking of such meats as heart, liver, and kidneys to make them appetizing; the use of nonfat dry milk in various dishes; the preparation of a few dishes from different cultural backgrounds; and most of all, the preparation of foods that are low in sodium, made tasty with food flavorings other than salt, foods low in calories which are "good to eat," foods permitted on gastric and low-residue regimens, and foods low in protein but high in calories.

NUTRITION

Vol. 11, Autumn 1956

*A case of food faddism which led to osteomalacia. M. Hill.—p. 319.

Food Faddism and Osteomalacia. The dietary history of a patient who had inadequate vitamin D intake is given, the inadequate intake being the result of a fad diet, in which a child refused to eat butter, margarine, fatty meat, oily fish, cream, milk, eggs, cream cakes, liver, and all other fatty foods. The occurrence of vitamin D deficiency today when normal dietary intake should be sufficient should be expected to be very rare. A quotation is given which states that not a single case of osteomalacia in the U. S. is due to simple lack of vitamin D. The dietary history given, however, illustrates that it still may occur.

NUTRITION REVIEWS

Vol. 14, September, 1956

*The beginnings of essential nutrition. E. V. McCollum.—p. 257.

*Nitrogen, fat and mineral metabolism in gastrectomized patients. Clinical Nutrition.—p. 266.

*Why are the thin lean? Clinical Nutrition.—p. 267.

Beginnings of Essential Nutrition. From the earliest application of chemical methods to the study of nutrition, the two most important objectives were to learn what a diet must provide to supply the physiologic needs of the body and to find analytic procedures for assessing the nutritive values of foods. T. B. Osborne is mentioned by the author as an outstanding contributor to knowledge of proteins in his generation. He showed that in each of thirty-two kinds of plant seeds there were several different kinds of proteins with distinct characteristics and that none was duplicated even in such closely related cereals as wheat, rye, and barley. He recalled also that the first important discovery made with his rat colony was that fats were not, as had been believed, sources of energy alone, but that some contained an unsuspected nutrient, later known as vitamin A.

Nitrogen, Fat, and Mineral Metabolism in Gastrectomized Patients. Although man can get along without his stomach, the operation of total gastrectomy results in certain alterations in his metabolism. Results are reported which indicate that in the gastrectomized patients, fecal nitrogen excretion was significantly related to nitrogen intake and that the amount of dietary nitrogen needed to prevent negative nitrogen balances was greater than in normal subjects. Eight of nine totally gastrectomized patients had a high excretion of fecal fat. The regression line representing the relationship between the fat intake and excretion was significantly different from that in normal persons, and average fecal fat excretion (20.2 per cent of intake) was significantly higher than that calculated from data for normal individuals. The metabolism of minerals did not differ in the gastrectomized patients from that in normal controls.

Why Are the Thin Lean? This study offers evidence indicating that lean individuals have no metabolic or digestive peculiarity which will account for their leanness. Since the subjects consumed without effort all of the excess food in a high caloric period (ten to fourteen days), it is suggested that the low caloric intake of the men when they are on an *ad libitum* diet is not limited by the capacity of their stomachs. The increased caloric intake resulted in an increase in body weight. The obvious conclusion is that the thin person just doesn't eat enough to bring his weight up to normal standards. There is, unfortunately, no answer as to why he doesn't eat more.

PROCEEDINGS OF THE NUTRITION SOCIETY

Vol. 15, No. 2, 1956

*Anaemia associated with malnutrition in the tropics. A. W. Woodruff.—p. 110.

*The role of pteroylglutamic acid and related compounds in macrocytic anaemia. G. H. Spray.—p. 119.

*The absorption of vitamin B_{12} in the megaloblastic anaemias. J. R. Evans.—p. 126.

*Anaemia and vitamin B_{12} dietary deficiency. F. Wokes.—p. 134.

*Food processing and nutritive value for man. H. R. Barnell and D. F. Hollingsworth.—p. 142.

Malnutrition and Anemia in the Tropics. Many workers in the tropics believe the anemia is second only to malaria as a public-health problem. Megaloblastic anemia has received the most attention. Iron-deficiency anemia is common but is probably seldom a truly nutritional disease, the article explains. In most instances it is caused by blood loss secondary to hookworm infection. A description of a woman suffering from an obstinately refractory type of anemia which failed to respond to liver or to iron is given. The working hypothesis reached was that protein malnutrition was playing a part in the cause of the anemia and that when it was corrected, the anemia improved.

Pteroylglutamic Acid in Macrocytic Anemia. Pteroylglutamic acid (PGA) is chemically a compound isolated from liver and yeast. Folic acid has similar properties, and when the terms are used synonymously, confusion results. Many writers do use the terms synonymously, however. PGA is closely related in its anti-anemic effects to vitamin B_{12} and ascorbic acid. When used with nutritional macrocytic anemia in India, the patient's diet was deficient in calories, animal protein, fresh fruit and vegetables. In the southern part of the United States, PGA was used successfully in patients with low intake of animal protein. An early report showed that in Cuba, PGA produced great improvement in sprue. Pernicious anemia of pregnancy responds to PGA, and it also corrects megaloblastic anemia in infancy. Deficient intake of ascorbic acid probably plays a major part in the pathogenesis, the article states, and vitamin B_{12} is not effective in all patients.

Vitamin B_{12} Absorption in Megaloblastic Anemias. Studies with labelled vitamin B_{12} reveal distinctive patterns of absorption which may be useful in classifying the different forms of megaloblastic anemia according to their pathogenesis. When impaired absorption is due to lack of intrinsic factor, the defect may be corrected by giving small amounts of intrinsic factor together with the oral dose of labelled vitamin B_{12}. Where anemia is associated with intestinal disease, the absorption of labelled vitamin B_{12} is rarely improved by the usual doses of intrinsic factor but may be increased by very large doses.

Anemia and Vitamin B_{12} Dietary Deficiency. Deficiency of vitamin B_{12} with low serum levels occurred in "vegans" after several years on a diet containing no animal food, which was therefore probably deficient in that vitamin. The deficiency did not lead to pernicious anemia, but was accompanied by marked changes in the nervous system. Considering the vitamin values of vegan diets, citation is made of evaluations based on Fixsen and Roscoe's tables (1937–38) of vitamin values, indicating no shortage of vitamin A, thiamine, ascorbic acid, riboflavin, and niacin. The vitamin D intakes come entirely from margarine, of which some vegans eat very little and others as much as 2 oz. a day. It is noted that the folic acid content, though not directly determined, must have been

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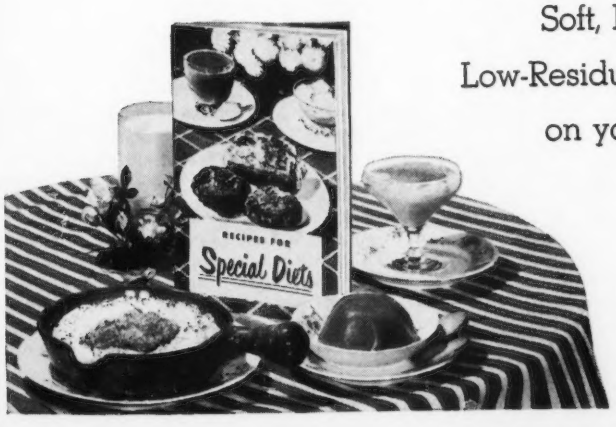

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raised by green vegetables, and this increase in combinations with low vitamin B_{12} intakes may have caused the nervous lesions sometimes observed.

Food Processing and Nutritive Value of Food. The effects of heat on the major constituents of foods are discussed. Heat action on protein is complex. Excessive exposure reduces the nutritive value, probably because of the differential destruction of some amino acids. Proteins are also sensitive to the removal of heat; hence the fish muscle toughens on freezing. Starch, sugars, and proteins are not normally affected by atmospheric oxygen. Powerful oxidizing agents, such as nitrogen trichloride, may have an effect on gluten and proteins, such as zein, casein, and egg albumen. Fats may become rancid on storage, particulary in the presence of air. Vitamin A is relatively stable to heat if oxygen is excluded. Vitamin D is moderately stable to heat, light, and oxygen. Vitamin E is fairly stable to heat but is destroyed during the development of oxidative rancidity in fats. It is noted that the most promising application of irradiation appears to be with foods such as meats which require long exposures to high temperatures to obtain sterility.

PUBLIC HEALTH REPORTS

Vol. 71, September, 1956

*An outbreak of Shigella gastroenteritis. M. D. Keller and M. L. Robbins.—p. 856.

Gastroenteritis Outbreak in Central Ohio. The school lunch in the rural area where an outbreak of shigellosis occurred was considered the single, common source because of its relation to the time of onset of the cases. The food handlers, neither of whom was ill but who had positive cultures for *Shigella sonnei*, type 1, could possibly have become infected as did the school population, but it is conceivable that one carried the organisms before the outbreak and contaminated the foods. In treating outbreaks in rural areas, there is the problem of not being able to treat patients with the most effective antibiotics. However, in this paper, the patients recovered without apparent complications within a period of a few days, even though few were given antibiotic therapy.

SCIENCE

Vol. 124, September 21, 1956

*Algae as sources of lysine and threonine in supplementing wheat and corn diets. J. M. Hundley, R. B. Ing, and R. W. Krauss.—p 536.

Vol. 124, September 28, 1956

*Indians in the Peruvian Andes. News of Science. —p. 576.

Vol. 124, October 5, 1956

Nomenclature of enzymes of fatty-acid metabolism. H. Beinert, D. E. Green, P. Hele, O. Hoffman-Ostenhof, F. Lynen, S. Ochoa, G. Popjak, and R. Ruyssen.—p. 614.

Algae as a Source of Lysine and Threonine. A shortage of protein in many parts of the world has stimulated studies for possible additional resources. It was found that the algae *chlorella* is an effective source of threonine in supplementing enriched bread, as judged by both growth and food efficiency. *Chorella* is a better source of threonine than purified soya protein and is equal to several animal-protein foods of high biologic value. Lysine can be produced synthetically at moderate cost.

Indians in the Peruvian Andes. This is a preliminary news report of a study being conducted of the Peruvian Indians in the high Andes of the White Cordillera. The over-all study will correlate the poor soils, inadequate diet, cold living conditions, and poor sanitation with the physical and medical status of these Indians. To date, physical studies of school boys and men have shown the average adult men to be less than 5 ft. 1 in. tall and to weigh only 114 lb. The boys are puny and underdeveloped. Only one or two of more than two hundred men could be considered fat by our standards. The diet of these Indians is being studied under the direction of Dr. Carlos Collazos, Director, Department of Nutrition of Peru's Ministry of Public Health. The dietary survey thus far indicates lacks in calcium, vitamin A, and riboflavin intake. Blood analyses are expected to confirm these findings, as well as low hemoglobin and low cholesterol. A final study of bone density by X-ray is likely to reflect the poor calcium intake and poor bone development.

SOUTHERN MEDICAL JOURNAL

Vol. 49, September, 1956

*The use of cobalt and iron in the prevention of anemia of pregnancy. H. G. Hamilton.—p. 1056.

Cobalt and Iron in Anemia of Pregnancy. The anemia of pregnancy is almost always anemia of iron deficiency. Iron therapy should be started at least 150 days prior to delivery. Iron therapy utilizing ferrous sulfate cobaltous chloride has been the most successful supplement used by these authors. No toxic or untoward effects have been observed.

ADULT LEADERSHIP

Vol. 5, October, 1956

*Relationships between agencies. L. This.—p. 104.

Relationships between Agencies. There are many organizations with which a relationship is possible for any one organization. Because any agency or agency administrator has definite limitations on the amount of personal time, staff and staff time, and funds that can be used for such inter-agency relationships, some criteria should be found to determine the organizations with which it is wise to maintain fairly close, formal, intensive, and prolonged relationships. The following are suggested: (a) Review your agency's primary purpose and services. (b) Which of these many agencies can probably be most productive to your agency in furthering its purpose and service? Be objective and try to rate the agencies and organizations. If the list is too long, you will at least have some guide in determining where to concentrate your efforts. (c) Is there any kind of specific help your agency needs: technical service or assistance, improvement of public relations, and so on? (d) What can your agency offer to another one that will materially assist that agency? (e) What are the maximum funds, personnel time, and time that you can devote to inter-agency relationships? It might be helpful to consider this question, worker by worker, and assign a block of time monthly for this purpose. (f) Try to assign inter-agency relationships primarily on the basis of logic and efficiency. Some the administrator must handle; others can best be done by lower staff echelons. In making assignments, an individual's personal interest or skills should also be considered. (g) All inter-agency relationships should be evaluated periodically—at least annually. Programs change and the programs of other organizations change, as well as personnel and interests.

AMERICAN RESTAURANT MAGAZINE

Vol. 40, October, 1956

*Broad results from good sanitation program. J. B. O'Meara.—p. 62.

*Dividends in dishes washed efficiently.—p. 88.

*Make fish your dish.—p. 114.

Sanitation Program. Restaurant patronage ceases when unsanitary handling of food is observed by a patron. Sanitary conditions also influence employee turnover. One reason for an ineffectual restaurant sanitation program is the failure of management to designate one person or several persons to be definitely responsible for the program. An excellent plan is to create a sanitation committee to meet once a week with each member responsible for a weekly sanitation survey of his department. Or, cooperation between departments may be stimulated if sanitation committee members inspect rival departments. In this way, poor sanitation practices which are more or less taken for granted by the employees of one department prominently stand out as wrong to the employee unfamilar with that department. A competitive spirit between departments is aroused to keep departments in top shape. New equipment tends to make sanitation easier to achieve, because the newer designs are created for ease of cleaning. However the human element is ever present. In addition to what the customer sees, there is something else which may drive him away—objectionable odors. There are many things causing an odor which can make a restaurant lose sales, whereas a clean, sparkling restaurant will just naturally boost sales every day. The customers' rest rooms should also be checked for cleanliness every day. Customers who visit this part of a restaurant before they order may never stay to eat if the rest room is not clean.

Dividends in Dishes Washed Efficiently. In planning a dishwashing

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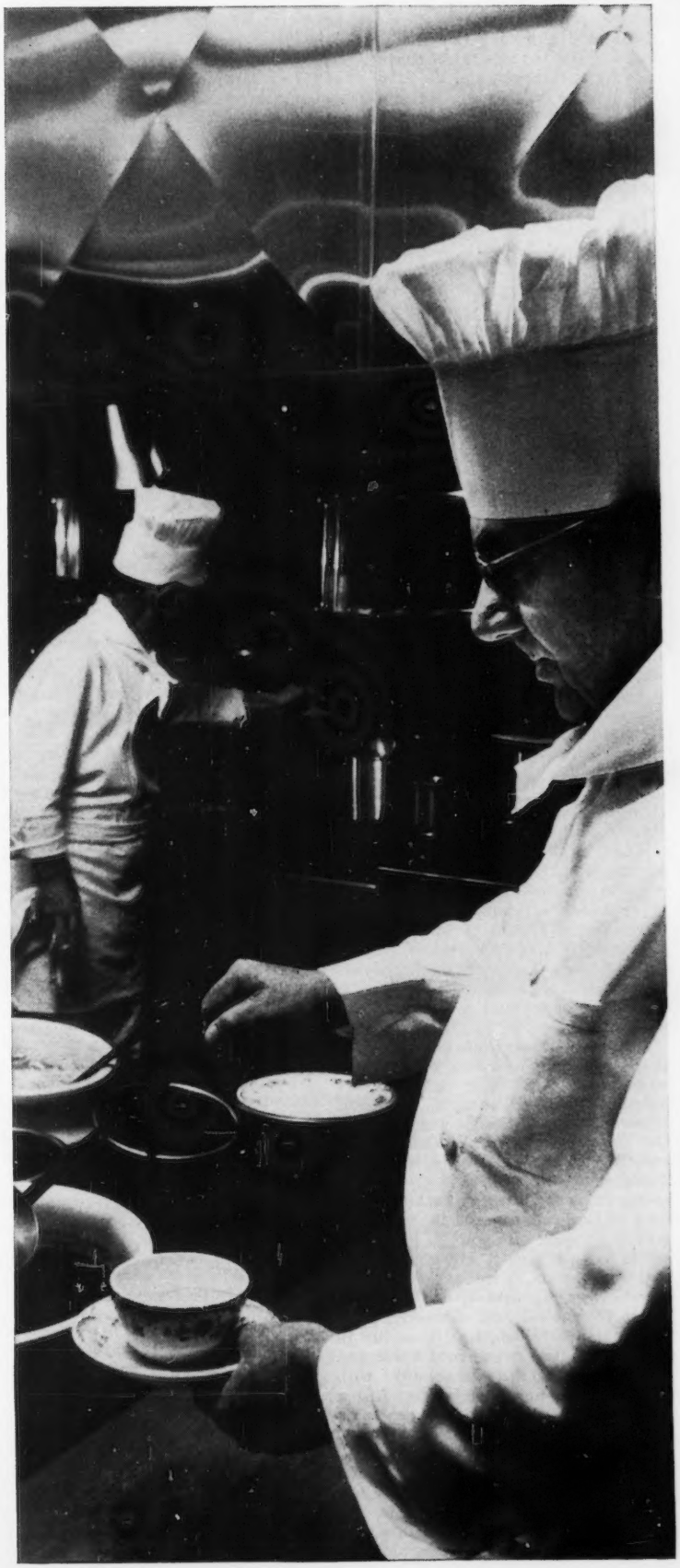

Brooklawn's Manager Al Brown and Chef Christ Aeniacos both agree: "Our reputation for fine food is maintained with the help of our modern Gas equipment."

"A good chef is distinguished by the fine sauces, soups, and other specialties he prepares," continues Chef Aeniacos. "When I'm preparing them with Gas, I know I have the careful control demanded for such dishes. And *only* Gas gives the kind of control I need."

At present, the kitchen staff at Brooklawn is cooking with 3 Garland ranges, 2 Garland fryers, and a Garland broiler, along with a 5 deck Magic Chef Gas oven. Years of experience back up their choice of Gas equipment. "With Gas," adds Mr. Brown, "we never have the problem of breakdown. Its dependability is the chief reason I prefer Gas."

The compact, streamlined arrangement of this modern Gas equipment is typical of the clean, efficient kitchens installed in thousands of hotels, clubs, and restaurants. There are other advantages with Gas cooking, too. Modern Gas cooking is clean, fast, efficient, and versatile enough to meet the most exacting demands.

When you install a new kitchen or remodel or expand your present one, call your Gas Company Commercial Specialist and discuss the economies and results modern Gas equipment provides. *American Gas Association.*

set-up, prime consideration must be given to determining the best possible location and the amount of space available for such needs, and the relation of the area to what would be a normal flow of soiled and clean dishes. Service requirements should be analyzed. A determining factor in selecting size of equipment must be the number of people to be served at peak meal periods. The payment of a few hundred dollars more for larger-capacity equipment can pay big dividends when increased needs become evident. For the selection of a dishwasher of suitable size for a specific type of restaurant, there are several types of machines available. There are spray-type machines in single tank roll top units, single tank door types, single tank curtain push-through types, and automatic conveyor units ranging in size from one to four tanks. Immersion-type dishwashers are also available which are adaptable to installations beyond city limits where there may be a power or sewage disposal problem. Some points to remember in planning and operating a dishwashing department: to achieve cleanliness as economically as possible, get the best combination of equipment, dishwashing compounds, and operating personnel. In washing china and plasticware, prerinsing to remove the loose and excess soil is essential, for the washing machine is designed for cleaning, not garbage disposal. Dishes should be stacked in racks to go through the machine for the machine cannot clean them efficiently if they are piled or nested. Dish machines should be kept in good mechanical condition—clean, with water volume and temperature right. For best cleaning results use an electronic detergent control which maintains the washing solution at desired strength—never wastefully high, never ineffectively low. A rinse-aid feeder can be obtained to facilitate perfect rinsing. Of major importance in cleaning glasses is the use of a proper concentration of washing product and a thorough and abundant rinse.

Make Fish Your Dish. In buying fish in the round, the following points should be observed: eyes bright, clear, full, and bulging; gills reddish-pink, free from slime or odor; scales adhering tightly to the skin, bright-colored with characteristic sheen; flesh firm and elastic, springing back when pressed, not separating from the bones; odor fresh, free from objectionable odors. Servings are generally based on ⅓ to ½ lb. of the edible part per person. Fresh fish should always be packed in ice for delivery and be well iced when received. Keep the fish in the coolest part of the refrigerator. Frozen fish compares favorably in appearance, flavor, and food value and may be used interchangeably with fresh fish. When purchasing frozen varieties, the allowance per person is the same as for fresh fish. Once frozen fish has been thawed, it must be used immediately and never refrozen. Thawing fish at refrigerator temperature has become the accepted practice. The fish should be held at this temperature only long enough to permit ease in preparation. Whole or drawn fish may be thawed more readily by immersing in cold running water, or if imbedded in crushed ice. A wide variety of canned fish is available, also. Both lean and fat fish may be fried or prepared by any standard method, if allowance is made for the fat content. The most important point in fish preparation is to prevent overcooking. The variety of dishes which may be made from fish is almost limitless and many special fish sauces have been developed by famous chefs. Included here are recipes for eleven sauces, broiled whitefish Almandine, deviled fish fillets, pompano papillotte, and a "fish dinner in foil." For this last dish, frozen fish fillets are placed on a large square of aluminum, sprinkled with lemon juice, spread with onion slices, then paprika, and surrounded by narrow strips of potato which have been rolled in chopped parsley and chives. The foil is secured around the ingredients, the package is baked in a hot oven for 40 min., and the result is a hearty fish dinner.

COLLEGE AND UNIVERSITY BUSINESS

Vol. 21, October, 1956

*Where do they eat? In union building or residence? H. W. Jordan.—p. 54.

Where Do They Eat? The trend in residence hall feeding is upward, and it might appear that residence halls offer unfair competition to the college union. The author, however, suggests that with the continual expansion of our colleges and universities, there is room for both. At Indiana University, Bloomington, a new addition to the Memorial Union is in prospect in spite of the continual residence hall expansion and decrease in student feeding. However, the Union has offset the decrease by appealing to the faculty and staff; by helping promote continuation study groups; by providing better and more attractive facilities for alumni, parents, and friends; by having more activities to attract students during their leisure time; and by providing the whole university family with a common meeting place. A recreational area of 23 acres on a lake 8 mi. from the university has been purchased by the Union which will open an entirely new field of activities for the university family.

HOSPITAL MANAGEMENT

Vol. 82, October, 1956

*Paper cups for portion control.—p. 92.
Tray treats for Hallowe'en.—p. 94.

Paper Cups for Portion Control. Paper cups used in various sizes offer an easy and effective method of portion control as the need to weigh or measure foods is eliminated. The cups are easily stored and present no dishwashing problems. More than 50 per cent of the items of a standard meal may be portioned in this way—hot food containers in 6 to 16 oz. sizes, suitable for portioning many entrées, and cold food containers ranging in size from 5 to 12 oz., suitable for a large number of summer dishes. The smaller lidded cups may be used in portioning fluid items. High cost items served in small quantities and most difficult to portion by hand are easily portioned in paper cups. Savings in time and labor usually cover the cost of the paper items without considering the saving in collecting, washing, and storing other types of utensils and loss through breakage. By experimenting with scales and portion cups or containers, it is possible to convert the measure of weight of any food into terms of the appropriate cup size and establish the appropriate portion cups to be used for each food. Also, because paper is an excellent insulator, it is possible to pre-portion hot vegetables in paper cups as much as an hour before rush time and place in drawer-type food warmers. Paper also is suitable for advance portioning of cold foods to be stored in refrigerators. Tables showing paper cup servings in various standard measures are included.

HOSPITALS

Vol. 30, September 16, 1956

*We solved the cold food problem with airline food service. J. A. Vanderslice, Jr.—p. 80.

Vol. 30, October 1, 1956

*Hospital dietetics abroad. F. S. M. van Schaik, E. Serianni, and M. Neumuller.—p. 88.

Airline Food Service. The cold food problem was solved in the 600-bed Hahnemann Medical College and Hospital, Philadelphia, by means of departmental reorganization and the installation of the airline method of food distribution. Kitchens were consolidated, food production area was redesigned, equipment was selected on the installment plan, and the new food distribution system was inaugurated. The airline type of food service was chosen because it offered: speedy service; facilities for serving a selective menu; and means for maintaining proper temperature in both hot and cold foods. Also, the hospital had the means to provide the essential pieces of equipment to change over to this service. Allotting 90 min. for the entire food service period, it was determined that two dietary aides could serve eight trucks in this time. They could combine hot and cold food on the tray on the floor, serve the patient, return the trays to the trucks, and clean the trucks. Any omissions on trays would be sent to them immediately from the kitchen. Men would deliver trucks to the "plug-in" stations on nursing floors and return the trucks to the dishroom. To avoid mistakes in assembling the hot and cold items on the tray, a selective menu card perforated down the middle with hot items listed on one side, and cold items on the other side was adopted. The patient would then place his name, room and bed number on both sides of the card. The director of nonprofessional services and the chief engineer developed truck handling and elevator procedures. The director of the dietary department tabulated all information and wrote the final equip-

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ment purchase orders in consultation with the administrator. Final departmental reorganization took place with the physical consolidation. Food checkers trained in the preparation of modified diets took charge of their respective crews at the tray assembly lines. Food production operations were overseen by food supervisors. The dietary aides, dishwashers, and truckmen reported to their respective foremen who, in turn, reported to the administrative dietitian.

Hospital Dietetics Abroad. Representatives of three European dietetic associations participating in the Second International Congress of Dietetics in Rome in September, 1956 present views on the dietetic profession in their countries. The *Netherlands* representative reports that about half of the dietitians are employed in hospital work. There the dietitian may supervise the kitchen department, the modified diet kitchen, maintain regular contact with patients, and instruct patients in the clinic and out-patient department. If a hospital dispenses with the service of a dietitian, management of the kitchen rests with the head of the kitchen or with the first assistant of the head, under the supervision of the head of the domestic department. In the Netherlands there is not only a shortage of dietitians but of other qualified personnel for domestic work. . . Dietetics is in the pioneering stage in *Italy*, and there is a great need for more professionally qualified personnel to direct and supervise the hospital dietary services. The general trend of food distribution is from a central kitchen, and most of the food preparation and service activities are directed by non-professional personnel. A large percentage of the patients are on modified diets, and a diet manual showing data on seventeen diets is now in use in Rome hospitals. . . In *Sweden*, the first training course for dietitians dates back to 1917; today, about forty dietitians are graduated yearly. All full-fledged hospitals employ graduate dietitians, but a hospital must have 250 to 300 beds to justify the employment of an assistant dietitian. To meet the shortage of qualified personnel, smaller hospitals may obtain food from a larger hospital kitchen or an outside dietitian may serve as a consultant. Swedish kitchens are usually modern and well equipped.

INSTITUTIONAL FEEDING AND HOUSING

Vol. 7, October, 1956

*Spice and herb selector chart.—p. 27.

*Open-hearth "charcoal" broiling techniques.—p. 40.

*Buy tuna to meet your needs.—p. 52.

Spice and Herb Selector Chart. Uses for thirty-three spices throughout the menu from appetizer to dessert are outlined. For new seasoning ideas, select the menu classification listed on the left of the chart and read across for the list of foods in this group under the name of the spice that complements the flavor. The chart is designed to be removed from the magazine and used as a permanent part of menu planning equipment.

Open - Hearth Broiling. Open - hearth broiling has certain advantages over other methods of cooking meat, fish, and poultry. It is faster, gives a seared, carmelized surface to the broiled food which improves appearance and taste, and it uses no grease except that in the food itself. Whether charcoal or a gas flame and refractory unit is used, the basic broiling principles are the same and the food tastes alike. The temperature at the grill or cooking surface should be 375° to 500°F. for broiling. A standard commercial oven thermometer may be used to determine the hottest areas of the grill or cooking area. The following suggestions will help you get the most from open-hearth broiling: (a) Thicker pieces of meat, whole fish, or half-chickens should be broiled over lower heat to prevent undue charring of the surface. (b) To prepare meat for "well-done" orders, trim away most of the fat and cook at a lower temperature. Chicken and fish to be served well done also require the lower heat. (c) Do not salt meat or fish before broiling as the salt screens the heat from the food; natural juices are lost more rapidly, also. Do salt poultry before broiling to prevent too charred a surface. (d) Raw pork is almost never broiled because of the necessity for cooking the meat "gray" throughout. (e) Veal is seldom broiled because of the lack of fat. Connecting tissue usually requires a longer cooking time than is possible with broiling. (f) Lobster may be prepared on open-hearth broilers but requires much basting. (g) Fish requires basting two or three times during broiling. Butter, margarine, salad (cooking) oil, or a basting sauce of lemon juice and spices mixed with oil may be used. (h) Meats and poultry should not be basted or covered with sauces which hide the flavor. (i) Filet Mignons and other lightly fatted meats may be brushed with butter or garlic butter before broiling or when first placed over the fire to give a more even browning to the meat and prevent charring. (j) Meat, fish, and poultry will cook faster and evenly if they are permitted to reach room temperature before broiling. An open-hearth broiling time chart accompanies the article.

Tuna Buying. When buying tuna, read labels carefully. Select the type that best meets the requirement of your food service standards. Choose the grade or grades according to the recipe use. Solid pack may be preferred for salad use, chunk for creaming and casseroles, chunk or flakes for sandwiches, and so on. The net weight given on the label represents the entire contents of the can, fish and liquid. The drained weight may be considerably less than the net weight. White meat tuna is premium-priced and is characterized by its bland taste and white flesh. Light meat tuna has the advantage of lower cost; a richer taste and excellent texture characterize the rosy, pink flesh. Solid pack is the fanciest grade; chunk-size tuna consists of medium-size pieces with some flake, and flake or grated tuna is made up entirely of small pieces. Institutional-size packs come in 1- and 4-lb. cans. A buying guide is included, which shows net and drained weights for solid and chunk styles.

INSTITUTIONS

Vol. 30, October, 1956

*Women at work: plan kitchen accordingly.—p. 6.

Plan for the low calorie crowd.—p. 8.

*Bitters—flavor magic from a bottle.—p. 20.

*Guide to higher efficiency (Part 5). H. P. Caleva.—p. 29.

*Train from top down, not from bottom up (Part 3). M. Mitchell.—p. 56.

Hot water problems solved. R. J. Abramson.—p. 74.

Guide to do's, don't's of floor maintenance. A. B. Grimes.—p. 90.

*Make work easy. L. H. Kotschevar.—p. 138.

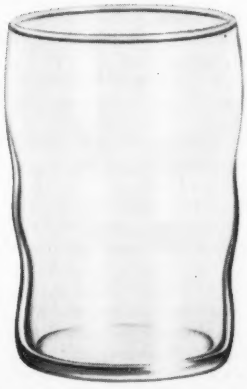
*10 steps to consistent meat quality.—p. 150.

Food Service Tasks Tailored to Women. The award-winning kitchen at the University of Kansas Medical Center, Kansas City, Kansas, has facilities planned and equipped so that women, who make up 94 per cent of the dietary staff, can work comfortably and efficiently. Work tables, bins, and racks are equipped with wheels to minimize lifting; dollies move large mixing bowls, racks of cups and glasses, and removable waste cans; half-size roasting pans are used for ease in handling. Modular sizing was followed in the selection of custom-fabricated installations or purchased equipment. Because reduction of labor time was another goal, both placement and choice of equipment were factors used to reach that end. An industrial-type pot and pan machine requiring only one operator per shift is one example of the result of such thinking, as is the use of steam for cleaning equipment. Checking the old operation proved helpful in designing the new cafeteria and snack bar facilities. The new building was planned so that each type of food moves from production on to pass-throughs to serving counter in a direct line. An increase in counter space and production area affords a virtually unlimited selection of food. Serving times were realistically adjusted, and food is now available continuously from 6:30 a.m. to midnight with an increased patron count. Illustrations and a layout diagram are included.

Bitters Flavor Magic. Aromatic bitters, used in small quantities, has a unique quality of blending and "marrying" other flavors as well as adding a subtle flavor of its own. A very small amount of the spice is all that is needed in any recipe, and it is extremely simple to use because of its liquid form. Bitters can be used to correct blandness or oversweetness, as well as to improve the flavor of salt-free stews and vegetable dishes. When cooking with bitters, it is important to blend it in thoroughly because of the small quantities used. In most cases the bitters is added toward the end of the cooking or after the cooking is completed. Recipes using bitters are given, as well as a list which suggests correct proportions of the spice in a variety of food items.

At Indiana University's Medical Center Union . . . Libbey Heat-Treated Glassware gives long, economical service

An interior view of the dining room, seating over 350.



The Governor Clinton pattern is used in the Indiana University Medical Center Union Dining Room and Snack Bar. Pictured is No. 610, 9½ oz. Heat-Treated Water Tumbler.

The modern snack bar . . . for fast dining service.

At the beautiful new Indiana University Medical Center Union, Indianapolis, Indiana, Libbey Heat-Treated Glassware is used for dining room and snack bar service. This attractive glassware gives extra long life and operating economy . . . economy assured by Libbey's guarantee: "A new glass if the rim of a Libbey 'Safedge' ever chips."

The dining room in this magnificent new building seats over 350. Its restful décor is carried out in the modern snack bar, too—providing pleasant dining service "from bite to banquet."

Libbey's Heat-Treated Governor Clinton pattern complements these attractive rooms . . . and of course, gives long service under the severest conditions. These Heat-Treated Tumblers are specially processed to withstand rough treatment and high sterilization temperatures . . . reduce breakage, require fewer replacements, and thus keep necessary inventory at a minimum.

In the finest hotels and restaurants across the country, Libbey Glassware gives many operating advantages. Whether your operation is large or small you can afford the benefits of this fine Libbey service. See your Libbey Supply dealer, or write Libbey Glass, Division of Owens-Illinois, Toledo 1, Ohio.

For over seven years a code symbol has enabled restaurants and hotels to check the remarkable durability of their Libbey Heat-Treated DATED Glassware. Results of these many surveys show an amazingly high average number of servings per tumbler . . . which means extremely low tumbler cost per 1,000 servings.

The names of these leading restaurants and hotels, and full details of their own surveys, will be supplied on request.

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Higher Efficiency. In this fifth installment of a series, the author gives job descriptions for a glass washer and a pot washer, listing work performed for each, equipment used, materials handled, working conditions, relation to other jobs, and qualifications needed.

Train from Top Down. Group classes are just half the training program. On-the-job training is the other half. It is a step in training which involves telling, showing, repeating, and asking questions. Both phases of the training program should be carried on simultaneously. The third phase is refresher or follow-up training. This is a continuous process whereby employees are kept alert to the challenge of their own jobs. Daily supervision is a part of follow-up training, as well as checks on quality of food, frequent interviews with the individual workers to review progress or lack of it, and frequent references to information and points previously discussed in group classes. The matter of frequent interviews is an important part of the relationship between worker and supervisor and leads to better understanding. With a well-planned program and supervision to follow through, any goal can be attained. Good training will bring these results to your department: quality production, efficiency, personal happiness of all members of the team, and a respect from all whom it serves.

Make Work Easy. Studies show that workers produce only 45 per cent of their time on the job. Work simplification principles can be applied to the food service industry to increase productivity from 20 to 50 per cent. To maintain a high productive rate, three kinds of rest must be provided. First, the muscles of the body, like the heart muscles, must have small momentary fractions of rest between work motions. Setting and maintaining the proper pace is extremely important in achieving satisfactory production. Second, after a sustained period of work, a worker tires, his energy reserves are depleted, and short momentary flashes of rest are not enough for recovery. Thus while short breaks of 3 to 5 min. taken during a shift eliminate fatigue and raise production, workers also require sufficiently long periods of rest between shifts to rebuild their energy. Work simplification principles state that work is easier and quicker to do if the two hands begin as well as complete work motions at the same time. Placing all tools and materials in definite fixed places makes work easy. These places should be close to and directly in front of the worker. Gravity or drop deliveries should be used to deliver materials closest to the point of use. Furthermore, the location of foods and materials should be such that they are easily seen and grasped and so placed that they permit the best sequence of motions. Working conditions also affect the ability of workers to work and can increase the difficulty of making motions. Good light, fresh air, comfortable seats, proper work heights, and freedom from noise are essential if work is to be done economically and without undue effort. A circular work place is of great advantage in the placement of tools, materials, and equipment. However, kitchen work is not highly repetitive and jobs vary from day to day. This means that more equipment and more space will be required to do the work than is desirable if the principles for maximum and normal work place areas are to be observed. However, if a unit is designed so that portable equipment can be moved in and out, then it is possible to convert a unit quickly from one type of a circular work place to another and thus preserve the island type of arrangement and conform to good work principles. Illustrated on these pages are several jobs which were made easier through the application of these methods.

Consistent Meat Quality. A commercial restaurant organization insures quality control by means of a ten-step process of selection, preparation, and storage of meat. Most of the meat is personally selected at the slaughter house. On delivery, it is weighed, checked, and placed on a special conveyor system. Tenderloins and sirloin tips are removed and the shells continue down the processing line. Shells are hung six to a tree for ten days and then go back into production. Steaks are individually bagged (as well as prime rib and tenderloin). After clamping each bagged steak, the bag is dipped in hot water for a brief instant to shrink the plastic bag tightly around the steak. Air has already been removed. This system has lengthened the effective storage time for steaks by ten days. Steaks are stored in metal drawers in the cooler and a numbering system is used to identify those stored and the number of units per drawer. All steaks used are bought fresh and handled in this manner. None is frozen.

RESTAURANT MANAGEMENT

Vol. 79, October, 1956

*Classifying jobs. R. F. Thurston.—p. 50.

*How a survey cut waste motion 10 ways. D. Lukens.—p. 60.

*Getting the most out of spices and herbs.—p. 62.

Classifying Jobs. The author suggests a practical way to divide the restaurant work load efficiently and fairly which is suitable for the small restaurant as well as large. The fundamental points for setting up this method of assignment are: (a) Draw a plan of the area—lobby, dining room, kitchen, storage, grounds, and so on—including all equipment. (b) Write on each plan or area the work that must be done daily, weekly, and so on. (c) Divide this work under three categories: service, housekeeping, maintenance. (d) Set up the number of jobs and classify with a job title for each number. (e) Write an hourly description of what work is done under each classification, including meal periods, reliefs, and days off. (f) Assign some responsibilities to every employee covered in these classifications. (g) Write a job description for every employee in the operation. The use of this method to define the work of a restaurant will show profitable results by eliminating unnecessary duplication of work by more than one shift, for example, by increasing efficiency, and by gaining greater employee cooperation.

Cutting Waste Motion. A restaurant which serves four hundred meals a day with only a small staff used a study made in another restaurant to help build and operate the new establishment. A quality plate lunch for 50 cents is featured, and because it is completely standardized, one to half a dozen plates may be made up ahead of time. As a result, customers are eating in less than 3 min. after seating. The side-serving of cream with coffee was eliminated in favor of cream served in the coffee, in an effort to cut down on labor, as was the glass of water—the latter is cheerfully served on request. A rigid no-substitution rule eliminates considerable lost time and speeds up service. Straws replaced glasses in the service of milk and soft drinks. To eliminate time lost in cleaning corners and under low fixtures, as well as time spent removing the smudge deposited on walls and fixtures by greasy cooking fumes, all fixtures were raised 9 in. off the floor and a foot rail was attached to the counter instead of the usual floor supports. A high vacuum ventilating system which picks up all cooking fumes at the point of origin instead of drawing them through the air solved the grease problem. At the same time it eliminated cooking odors, even at the counter. Since there are no cooking odors, cooking and serving are all done in one room. A fifteen-stool, "L" shaped counter encloses the entire work area, separating it from five six-place booths which bring the entire seating capacity to forty-five. The work area is divided lengthwise by a metal partition. This partition houses the ventilating duct and all gas, water, and electric service lines.

Spices and Herbs. To get the best results from spices, they should always be stored in a cool and dry place. The most practical system is to keep most of the supply in the regular storerooms. Draw on this as needed to fill small kitchen containers, which should always be kept tightly closed. Quality in spices is determined by grades and freshness. Freshness is something anyone can tell at a sniff, but a certain amount of aroma does not necessarily indicate flavor strength. The nose test with spices should show them to have strong, forceful aroma which meets you head on when you open the lid. Whole spices are more suitable for long-cooking dishes, as the heat will extract their flavor slowly and allow the dish to become thoroughly permeated. Usually added in a cloth bag, they may be removed easily from the pot as soon as enough flavor has been added. Ground spices are used in shorter-cooking dishes and in some cases where no cooking at all is done. A spice chart which lists familiar recipes and the spices and herbs which give these dishes fine flavor is offered, with descriptions and added uses for these forty-one spices.

Juices need this advantage

Did you know that ascorbic acid may be added to certain fruit and vegetable juices to standardize their vitamin C content, thus overcoming wide variations which can occur *(see table below)*. Many nutritionists believe that the public interest is best served when the ascorbic acid content of processed juices is so standardized. A label statement of 100% of the minimum daily adult requirement may be made when a juice serving contains 30 mg. of ascorbic acid.

When a food processor improves his juice by raising or standardizing its vitamin C content he merits your support. If you wish information about good juices which are now made better through the use of Roche ascorbic acid, please write to the Vitamin Division.

Ascorbic Acid Content of Canned Juices

Below are examples of minimum and maximum levels of ascorbic acid in commercially canned juices. Note the wide variations! All figures are in milligrams per 100 grams of juice. Data from U. S. Department of Agriculture.

	Min.	Max.
Grapefruit juice	10.0	49.0
Orange juice	9.7	70.0
Pineapple juice	5.4	18.0
Apple juice	0.2	3.6
Grape juice	0.0	4.7
Tomato juice	2.5	32.0

It is in the public interest to standardize the vitamin C content of these processed juices and juice products.

Orange — Grapefruit — Lemon — Tangerine — Apple Grape — Pineapple — Cranberry — Tomato Vegetable blends

No matter which type of processing is used— Canning • Concentrating • Freezing • Dilution in the form of "ades"—your juice will be better when its ascorbic acid content is standardized.

New low price of ascorbic acid makes juice standardization more attractive than ever.

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News Notes

A.D.A. Citation by Red Cross. This year marked the seventy-fifth anniversary of the founding of the American National Red Cross. Among other activities, anniversary certificates have been presented to selected organizations for their outstanding participation in the work of the Red Cross. A.D.A. is the recipient of such a certificate. The citation reads: THE AMERICAN NATIONAL RED CROSS ON THE OCCASION OF ITS 75TH ANNIVERSARY EXTENDS TO THE MEMBERS OF THE AMERICAN DIETETIC ASSOCIATION APPRECIATION FOR THEIR DEVOTED SUPPORT OF AND PARTICIPATION IN THE HUMANITARIAN WORK OF THE RED CROSS. The citation is signed by Ellsworth Bunker, President, and S. Roland Harriman, Chairman of the American Red Cross.

Presentation was made by Dorothy L. Bovee, Food and Nutrition Consultant of the American Red Cross in Washington to A.D.A. President, Winifred Howard Erickson, at the annual banquet of the Association in Milwaukee on October 11.

Dr. Todhunter Honored. Word has been received in the A.D.A. office that our President-Elect, Dr. E. Neige Todhunter, has been made an honorary life member of the New Zealand Dietetic Association. This association, founded in 1943, now has one hundred members. In New Zealand, which is Dr. Todhunter's native land, dietitians are registered by a governmental Dietitians Board, which also sets standards of educational training. The law provides that at least two members of the New Zealand Dietetic Association shall serve as members of this Board. Dietitians' salaries, too, are regulated by law in New Zealand, and range from £777½ annually for the dietitian in charge at Auckland or Wellington Hospital down to £470 for a staff dietitian in a nurses' home. There are in addition, supplementary allowances amounting to 10 per cent of salary, with a maximum of approximately £60. Student dietitians receive from £393¾ to £411. President of the New Zealand Dietetic Association for 1955–56 has been Miss F. Davidson of the Department of Health, Wellington.

U.S.D.A. Research Advisory Committee Meets. More basic studies on the composition of foods so that producers, processors, retailers, and consumers can make the best use of foods was urged by the Food and Nutrition Advisory Committee of the U.S.D.A. when it met in Washington, October 29 to 31.

The eleven-member committee called for a broad, well-balanced research program in the field of foods, stressing that the search should be intensified to learn more about the many elusive factors in foods. The committee considered research in four major areas:

Food composition in relation to nutritive value. High priority was urged for expanding studies of the role of fats in nutrition. The committee also suggested expansion of studies on carbohydrates, minerals, vitamins, and other food elements.

Human nutrition. The committee felt that more work is needed to find better means of measuring the availability to the body of nutrients in foods. Studies on how one essential element in food may affect other elements was also urged.

Food quality in household use. The committee underscored the need for better methods and devices and more uniform ways of evaluating food palatability—that is, for standardizing measurements of flavor, texture, and color of foods. This need has been spotlighted by conflicting reports on the effects of insecticide and pesticide residues on plants, animals, and soils.

Food consumption and dietary levels. Development of new and improved methods and instruments for measuring quality of raw and processed farm products was also urged, and the committee asked for studies on food wastes to adjust estimates of nutritive value of national and family food supplies. Other recommendations included: expanded studies on how homemakers' background may influence their food habits, by determining homemakers' knowledge of nutrition and attitudes and opinions about food and how they may be connected with age, education, position, geographic region, and other cultural factors.

The committee elected as its new chairman, Dr. Pearl P. Swanson, Assistant Director of Home Economics Research, Iowa State College, Ames, to succeed Dr. Grace Goldsmith, Tulane University School of Medicine, New Orleans. Dr. Swanson is a member of A.D.A. Dr. H. H. Williams, Cornell University, was elected vice-chairman. Other members of the committee, the first three of whom are also members of A.D.A., are: Ethel Austin Martin, Barrington, Illinois; Dr. E. Neige Todhunter, University of Alabama, University; Dorothea F. Turner, Editor of this JOURNAL; Mrs. J. C. Merrill, Trenton, New Jersey; Dr. Day Monroe, Topeka, Kansas; Dr. James R. Wilson, Winnetka, Illinois; Dr. M. K. Bennett, Stanford University, Stanford, California; and Dr. Herbert E. Robinson, Chicago.

Center for Aging Research. Establishment of a Center for Aging Research in the National Health Institutes has been announced by Dr. Leroy E. Burney, Surgeon General, Public Health Service. The new Center will be part of the PHS's program to coordinate and accelerate its activities in the field of aging. The program will assist universities and other research institutions in establishing broad research programs which will include biologic, psychologic, and social science research. The first activity will be to aid in establishing comprehensive research centers on aging, to be supported in part by research grants from the National Institutes of Health.

Plentiful Foods MONTHLY LIST

The following foods are expected to be in plentiful supply in December according to the Department of Agriculture.

Protein foods

Beef
Chickens—broilers and fryers
Eggs
Milk and other dairy products
Peanut butter
Pork
Turkeys

Other foods

Cabbage
Corn, canned sweet
Dates
Lard
Onions
Pears, winter
Plums, canned purple
Potatoes
Prunes, dried

Change at Cornell. The School of Nutrition at Cornell University has been raised officially to the status of a graduate school and will be called the Graduate School of Nutrition. Dr. Richard H. Barnes who heads the school will have the title of dean, rather than director. The school was established in 1941, the first of its kind. Its program, a cooperative enterprise with other colleges of the university, includes course work and research in human and animal nutrition and in food technology, supply, distribution, and economics.

Pan American Sanitary Organization. In a move to promote better sanitation in the countries of the Western Hemisphere, a Technical Committee of Experts has been appointed within the Pan American Sanitary Organization for the purpose of drawing up recommendations in this field, particularly as applied to the protection of the health of travelers. At the meeting of the PASO in Guatemala City in September, the Committee was asked to prepare a manual of recommended minimum standards of sanitation in hotels, restaurants, transportation, and other tourist and travel facilities.

Symposium on Antibiotics. On October 17, 18, and 19, the Fourth Annual Symposium on Antibiotics was held in Washington. Recent discoveries and advances in the field were reported by medical scientists from the U. S. and nine foreign countries. Several new antibiotics, not yet commercially available, were described, including: oleandomycin, ristocetin, nucleocidin, hygromycin, alazopeptin, vancomycin, amphotericin,

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The hospital market has long been waiting for an individual insulated server made to specifications like these:

Balanced, easy-to-lift handle with thumb-lift lid; foolproof, no-drip pouring lip; inset and outer shell each durable stainless steel, styled in modern lines — and priced to make it available for every patient's tray.

And because it's Polar Ware, you know this new server is right — made of heavy gauge stainless steel, electro-polished on the inside and highly polished on the outside — the finest, longest-lasting finish there is! You'll be glad to know, too, that this new beverage server rides through a dish washer on its side, and it's made to exceed all U.S. Government standards for holding the temperature of hot or cold liquids.

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rich beef flavor

VEGETABLE SOUP

50 servings — 5 ounces each

INGREDIENTS

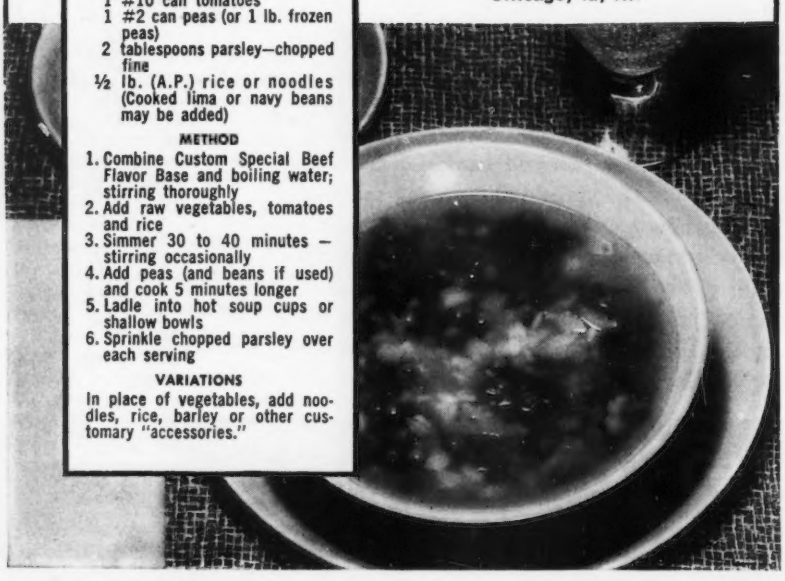
1-1 lb. jar Custom Special Beef Flavor Base
3 gals. boiling water
1 lb. diced carrots
1½ lbs. celery — diced
½ lb. onions — chopped fine
1 #10 can tomatoes
1 #2 can peas (or 1 lb. frozen peas)
2 tablespoons parsley—chopped fine
½ lb. (A.P.) rice or noodles (Cooked lima or navy beans may be added)

METHOD

1. Combine Custom Special Beef Flavor Base and boiling water; stirring thoroughly
2. Add raw vegetables, tomatoes and rice
3. Simmer 30 to 40 minutes — stirring occasionally
4. Add peas (and beans if used) and cook 5 minutes longer
5. Ladle into hot soup cups or shallow bowls
6. Sprinkle chopped parsley over each serving

VARIATIONS

In place of vegetables, add noodles, rice, barley or other customary "accessories."



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ascosin, and xanthocillin. Some of these have been found effective against organisms which are resistant to the older antibiotic agents.

The entire program of the last day of the Symposium was devoted to the problem of antibiotics in foods and their use in preserving foods. The efficacy of such drugs as Aureomycin and Terramycin in extending the shelf-life of foods, such as poultry, meat, fish, and vegetables, was discussed in detail.

Sponsors of the Symposium were the Food and Drug Administration and the journals *Antibiotics and Chemotherapy* and *Antibiotic Medicine and Clinical Therapy*.

Flavor Symposium. On November 19, Arthur D. Little, Inc., Cambridge, Massachusetts sponsored the first of a series of symposia on flavor and the technology of taste. The program included discussions by a number of specialists in this field. Dr. Lloyd M. Beidler, Head, Physiology Department, Florida State University, and Dr. Carl Pfaffmann, Professor of Psychology, Brown University, examined the basis of taste and smell. Taste testing in the laboratory and for consumers was reviewed by: Dr. Ernest E. Lockhart, Scientific Director, The Coffee Brewing Institution; and George F. Garnatz, Director, Kroger Food Foundation. Applications of physiochemical research on flavor was discussed by Dr. Eric J. Hewitt, Vice-President, Evans Research and Development Corporation.

Three other conferences concerned with laboratory flavor testing, consumer testing, and physicochemical research on flavor are planned for 1957.

Fellowship. Through the contributions of faculty, alumnae, and friends, a fellowship honoring Marie Dye has been established in the College of Home Economics, Michigan State University. This fellowship, worth $2,000, will be granted for the 1957-58 academic year and will be available for graduate study beyond the master's degree in a specialized subject matter area of home economics. Final date for acceptance of applications will be February 15, 1957. Further information may be obtained from the Dean, College of Home Economics, Michigan State University, East Lansing.

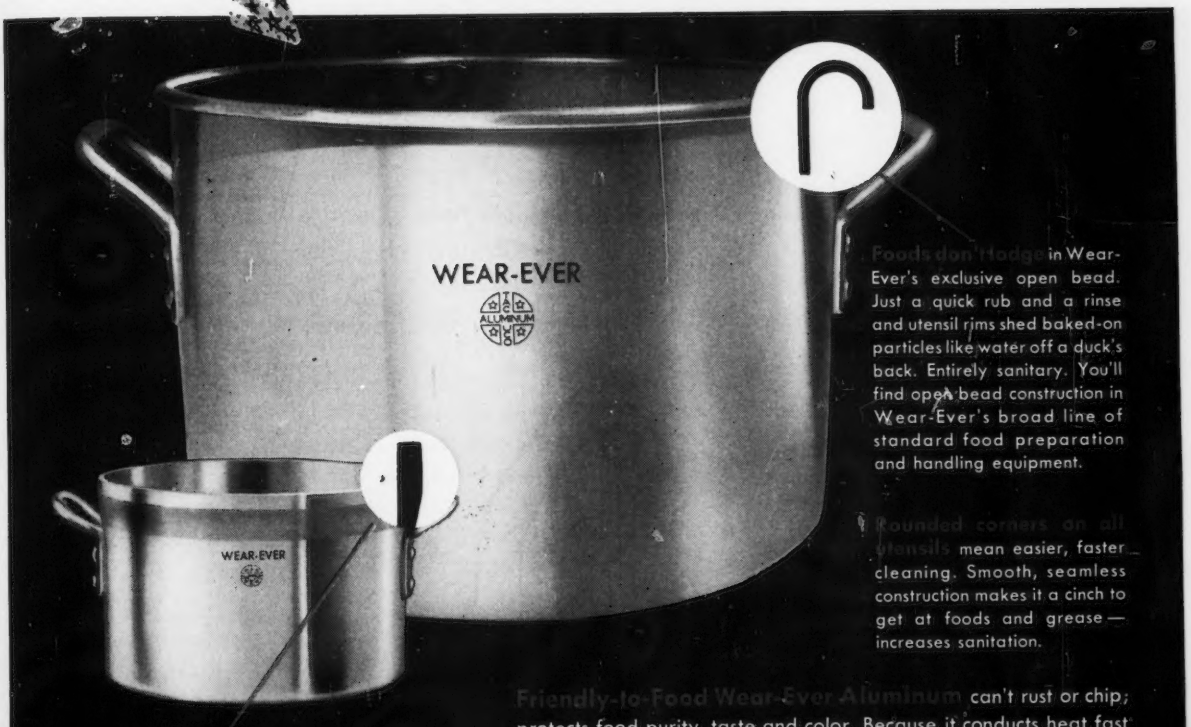
Film about Dietitians. Titled "Service of Love," a new 16 mm., sound motion picture in color about the dietitian's dedication to her profession is available for loan from the College of Medical Evangelists. The film has been planned to interest young men and women in the satisfying and rewarding career of dietitics and to acquaint the general public with the role of the dietitian and the profession. There is no charge for the use of the film, which runs 30 min. Requests should be sent to: Community Relations Office, College of Medical Evangelists, 1720 Brooklyn Avenue, Los Angeles 33.

Fad Diets Decried. In the November issue of *McCall's* Magazine, the lead

A PACE-SETTER IN SANITATION!

ONLY WEAR·EVER OFFERS YOU OPEN BEAD

IN EASY-TO-CLEAN, EASY-TO-KEEP CLEAN ALUMINUM COOKING UTENSILS



Foods don't lodge in Wear-Ever's exclusive open bead. Just a quick rub and a rinse and utensil rims shed baked-on particles like water off a duck's back. Entirely sanitary. You'll find open bead construction in Wear-Ever's broad line of standard food preparation and handling equipment.

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Only sun-ripened fruit goes into these delicious fruit purees. Ideal for Low Residue and Diabetic Diets. Convenient, economical sizes. Companion items to the famous line of Cellu Unsweetened Fruit Juices. Vegetable Purees and Juices are also available under the Cellu label, prepared without added salt or sugar.

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BOMBAY

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feature article is devoted to "Why Fad Diets Fail." In it, the dangers of following fad reducing diets are clearly outlined, together with a recapitulation of some of the most widely publicized of such diets of the last few years. A logical, scientifically accurate plea for moderation in diet is made, along with an explanation of the fallacies and potential dangers of fad diets. Dr. Fredrick J. Stare, Head, Department of Nutrition, Harvard School of Public Health, is quoted as the authority for these soundly-based statements.

Accompanying the article is "*McCall's* Diet You Can Live By," which claims to be practical and based on fact, and which is "neither 'revolutionary,' 'new,' 'fabulous,' nor any other superlative." The would-be dieter is advised to make his own dietary history, which at the end of a week is to be evaluated using *McCall's* Calorie Chart for Men and Women. On the basis of these figures, the dieter can then determine from his self-made dietary history, what foods he can most easily omit to reduce his intake by 1000 calories a day—a reduction which will result in a 2-lb. loss a week. Final emphasis in the *McCall's* diet is maintaining the weight loss thus achieved.

New U.S.D.A. Publications. Yields and losses during preparation of 1301 food items are presented in *Food Yields—Summarized by Different Stages of Preparation*. Listed as Agriculture Handbook No. 102, food yields are reported as percent by weight and on the basis of average, maximum, and minimum data. Each stage of preparation is given separately, and the loss at a given stage yields the next preparation stage. This is a departure from previous practice in U.S.D.A. publications which formerly showed total losses in obtaining the raw edible portion. A list of 377 references is included. Copies of this report may be purchased from the Government Printing Office, Washington 25, for 50 cents each.

Food Expenditures, Preservation and Home Production by Rural Families in the North Central Region 1951–52 has been released as Agriculture Information Bulletin No. 113. In it, the authors—Mollie Orshansky, Ennis C. Blake, and Mary Ann Moss—report a 1952 survey of the amounts and kinds of food consumed by rural families in the twelve states of the North Central Region. Findings indicated that farm families in these states consumed food worth an average of $1358 in 1951, or more than $350 per person. Included in the $1358 is $608 worth of home-produced food valued at retail prices. For these farm families, home production on a per person basis amounted to enough eggs and potatoes and more than enough milk to meet recommendations in the moderate-cost food plan developed by the U.S.D.A., and over 80 per cent of the suggested amount for meat and enough tomatoes to supply 40 per cent of the recommendations for citrus fruits and tomatoes. Nonfarm rural families averaged somewhat less in food value—$1111 per family or $327 per person—with only 7 per cent of their year's food supply being home-

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MorCal is the ideal preparation for the institutional dietitian who must provide high-calorie supplementation that is easy-to-use, inexpensive and readily accepted even by the most fussy patient. When added to the diet, appetizing, cereal-like *MorCal* affords maximum caloric intake with minimum satiation. Over-active, fast-growing or underweight youngsters, convalescents, the chronically ill, or elderly persons are particularly benefited by the outstanding nutritional qualities of *MorCal*.

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***MorCal* is good-tasting** • Patients accept *MorCal* readily because it's delicious whether taken alone or blended with other foods.

***MorCal* does not tax digestive capacity** • *MorCal* furnishes a concentrated form of extra calories with little tendency to fat satiation or cloying aftertaste.

***MorCal* stimulates appetite and growth** • *MorCal* provides 12½ times the minimum daily requirement of vitamin B_1 and 6½ times the suggested daily supplement of vitamin B_{12}.

combines readily with foods in many appetizing ways

A delicious addition to milk or other beverages, *MorCal* improves flavor and adds calories at the same time. Sprinkled onto desserts or mixed into any end-of-meal dish, *MorCal* provides an extra-special taste treat. In casserole dishes, soups, vegetables, sauces and gravies, it blends readily with other ingredients. As a substitute for flour in cooking or baking, *MorCal* increases calorie content 30 to 100 per cent without adding bulk. A slightly nut-like flavor and moist texture for longer-lasting freshness is imparted to baked goods.

MorCal is a concentrated preparation of hydrogenated cottonseed oil, proteins and carbohydrates from dried skim milk solids and wheat flour and natural flavorings, plus appetite- and growth-stimulating vitamins B_1 and B_{12}. Just two rounded tablespoonfuls of *MorCal* four times daily (120 grams) add 720 extra calories to the diet. Each pound of *MorCal* contains refined vegetable fat 44%, carbohydrate 42%, protein 9%, mineral ash 2.5%, moisture 2.5%, vitamin B_{12} (cyanocobalamine) 50 mcg. per lb.

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Economical to use, *MorCal* costs less, per calorie provided in its concentrated form, than any other weight-gain product currently available. Special bulk prices are available to institutions and schools.

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produced. This report is for sale from the Government Printing Office, Washington 25, for 50 cents a copy.

Preliminary results of a 1955 nationwide survey of household food consumption have also been published by the U.S.D.A. under the title, "Food Expenditures of Households in the United States—Household Food Consumption, 1955—Preliminary Report." Some of these findings were reported in the October issue of the JOURNAL, page 1016. Single copies of these preliminary figures may be obtained free from the Office of Information, U. S. Department of Agriculture, Washington 25.

"A Bibliography on Fatty Acids in Foods and Other Commodities—1920–1949," is a mimeographed compilation of the Human Nutrition Research Branch, U.S.D.A., prepared by W. O. Lundberg, E. A. Breault, and O. S. Privett, The Hormel Institute, University of Minnesota, and edited by Verz R. Goddard. The bibliography includes not only food sources but some nonfood items of commercial or potential industrial importance. The 831 listings are annotated and indexed for easy use. Requests for copies should be addressed to the Human Nutrition Research Branch, U. S. Department of Agriculture, Washington 25.

The U.S.D.A.'s popular, six-page leaflet, "U. S. Grades for Beef," has been revised to include information on the new grade, U. S. Standard. The "Suggested Cooking Guide" has also been revised to include appropriate cooking methods for this new grade. In it are suggested cooking methods for each combination of U. S. grade and cut. Other changes include the addition of three illustrations of the stamps used for veal and calf and the "acceptance stamp" used when U.S.D.A. meat graders assist in filling specifications for large quantities of meat. Single copies of this publication, which is Leaflet No. 310, may be obtained free from the Office of Information, U. S. Department of Agriculture, Washington 25.

The first of a series of supplements to the U.S.D.A. card file of recipes developed for use in school lunches is now ready for distribution. Included are twenty-five recipe cards containing forty-seven recipes for breads and cereal products, fruits and other desserts, main dishes, salads, sandwiches, sauces and gravies, and vegetables. Each recipe is scaled to yield 100 servings, and one column is provided for recording quantities needed for the number of portions required for the children actually served in the individual schools. Copies of this Supplement to PA271, may be purchased from the Government Printing Office, Washington 25, for 30 cents a set.

Other Government Booklets. In connection with the "fish parade" sponsored last month by the Fish and Wildlife Service to increase fish consumption, a booklet containing helpful factual data was released. Titled "Fishery Products Are Being Featured—Join the Fish Parade," it offers information on the nutritive value of fish; market forms of fresh and frozen fish and shellfish; a tabular guide for buying 25 salt water fish, 11 fresh water fish, and 5 types of shellfish; and tips on purchasing fresh, frozen, and canned fish. In addition, statistics on fish production and employment in the fishing industry are presented. The booklet concludes with sixteen recipe and suggestions for garnishes. Copies may be obtained from the Fish and Wildlife Service, U. S. Department of Interior, Washington 25.

How to Cook Halibut by Kathryn L. Osterhaug and Rose G. Kerr is a second recent release by the Fish and Wildlife Service. In it are presented twenty-five recipes developed and tested by the Service's home economists. Out-of-the-ordinary dishes included in this collection are: halibut avocado cocktail, halibut and onion soup, curried halibut casserole, broiled halibut steaks with anchovy butter, halibut Hawaiian, halibut steaks with piquant meringue, and halibut in herb sauce. Attractive photographs illustrate some of the recipes. Listed as No. 9 in the Service's Test Kitchen Series, copies may be ordered from the Government Printing Office for 20 cents each.

From the Public Health Service comes the first nationwide report on the geographic distribution of nursing homes and general hospitals. Released as Public Health Service Publication No. 492 (also as Public Health Monograph No. 44), it is titled *General Hospitals and and Nursing Homes* by Jerry Solon and Anna Mae Baney. The survey indicated

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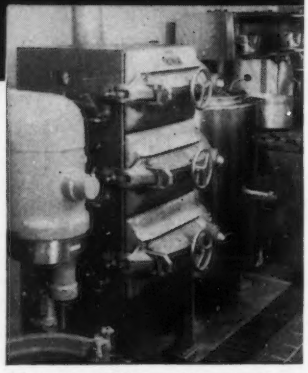

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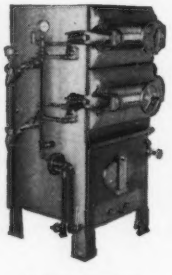

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MASHABANANA

and add a home-recipe touch to spice cake mix!

Students today are interested in the modern short cuts to good cooking that mixes provide. This recipe for Banana Spice Cake shows how simple home touches can add variety and interest to cake mixes. Mashed banana mellows the spice flavor, and makes a rich, moist cake with improved keeping qualities. Whole bananas between the layers are a novel and easy filling for many different types of cakes.

BANANA SPICE CAKE

Use any good packaged spice cake mix. Follow package directions for mixing, except:

When directions specify liquid only.....Omit liquid. Substitute 1½ cups mashed ripe bananas.*

When directions call for liquid plus eggs.....Reduce liquid to ½ cup. Add 1 cup ripe mashed bananas. Add eggs as directed.

Bake in an oblong pan, following package directions. When cool, cut in half crosswise. Cover one half with a thin layer of frosting and top with 3 or 4 whole bananas. Cover the bananas with additional frosting. Set other half of cake on top. Frost top and sides.

*Use fully ripe bananas, yellow peel, flecked with brown.

P.S. Banana Spice Cake was the most popular of all the recipes featured in the 1956 Old Farmer's Almanac.

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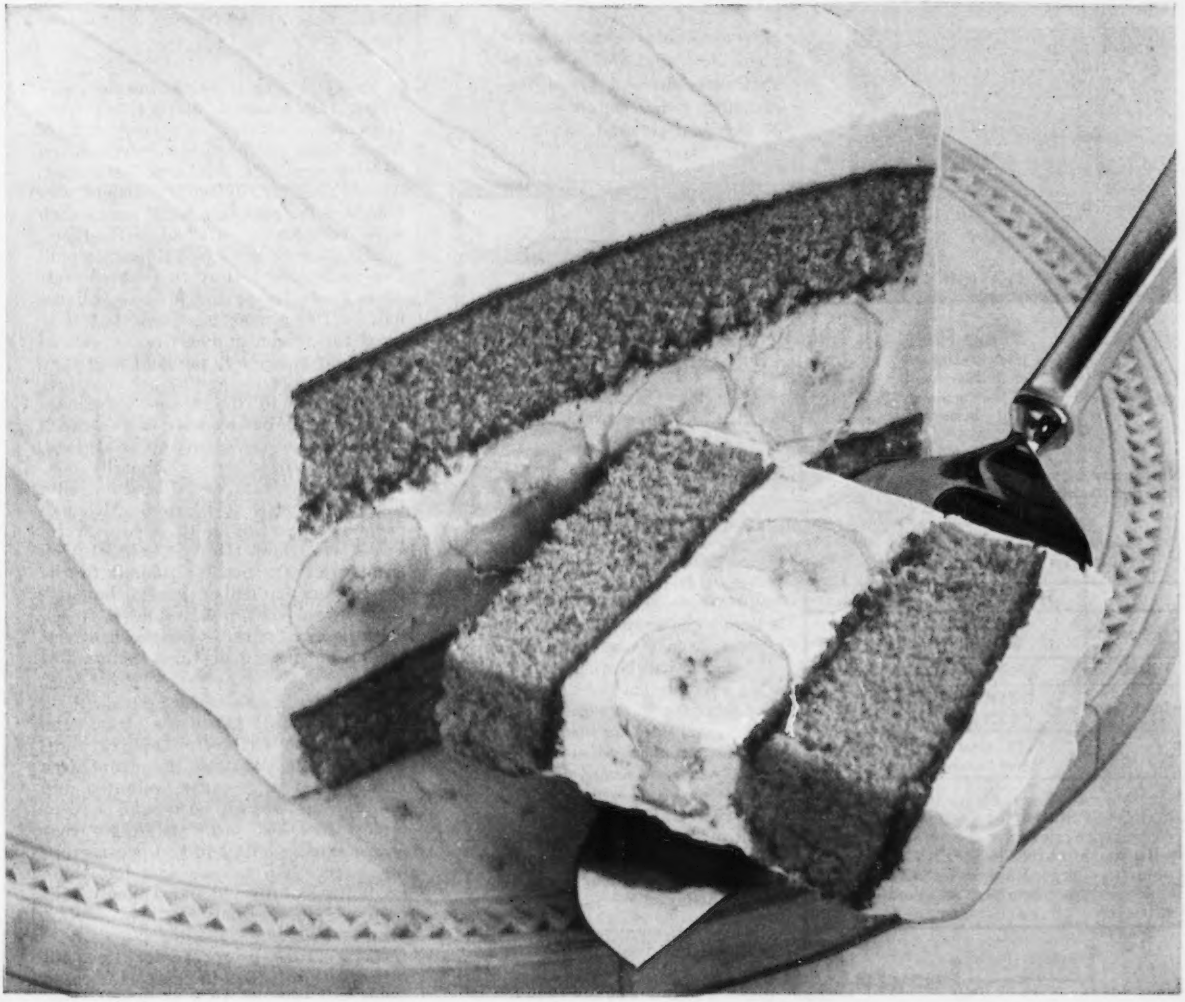

that in seventy-one metropolitan counties, there are 4.1 general hospital beds and 1.3 beds in skilled nursing homes for every 1000 population. In 896 isolated rural counties, there are 1.8 general hospital beds and 0.4 beds in nursing homes per 1000 people. The supply of both types of beds tends to increase with per capita income and availability of medical personnel. The number of nursing home beds, but not of general hospital beds, increases with the proportion of an area's population above sixty-five years of age. Copies of this report are for sale from the Government Printing Office, Washington 25, for 40 cents each.

Low-Calorie Peanuts? The U.S.D.A. has announced that research has achieved the removal of oil from peanuts without changing their physical appearance or reducing the high protein value. A handful of fifteen to seventeen of the de-oiled peanuts would have an energy value of about 17 calories compared with 84 calories of old-fashioned peanuts. The de-oiled peanuts are said to have a firm, crisp texture, to be slightly lighter in color than ordinary peanuts, and considerably milder and sweeter in flavor. Both color and flavor can be enhanced by roasting after the oil has been removed. Technical processing problems will need to be overcome before the low-calorie peanuts can be put on the market.

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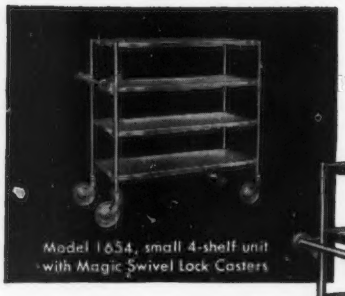
Now available in the two basic sizes illustrated and in 4 or 5-shelf models. All types furnished in either stainless steel or standard painted finish.



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Model	1654–1655 (small size)	2654–2655 (large size)
Shelf Size	19¾" x 43¾"	23½" x 51½"
Shelf Clearance	(1654) 10¼" (1655) 7⅞"	(2654) 10¼" (2655) 7⅞"
Casters	*8" double ball bearing	*8" double ball bearing

*Customer is offered choice of 2—8" swivel and 2—8" stationary casters or 4 swivel casters with one caster at each end equipped with magic swivel lock. Either choice at no extra charge. Bumper handles and continuous rubber bumpers supplied at slight extra cost.

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Here's quality from every viewpoint; from the smoothly rolling 8" double ball bearing casters to the smoothly finished shelves and uprights. No rough edges, no sharp corners. Shelves are welded to uprights and then ground smooth. Shelf edges are turned down with center panel recessed. Tops of all uprights are covered by chrome plated plug buttons. Yes, they're designed throughout for smooth performance and long life. Order yours today.

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Frozen Avocado Paste. Guacamole, (mashed avocado with chopped onion lemon juice, and salt) has long been a favorite salad for Mexicans and has acquired quite a following in this country among *norteamericanos* who have visited Mexico and brought the recipe back to serve friends. It has remained a luxury item, however, since avocados are so perishable that their nationwide distribution has been impractical. Only in Southern California and Florida, where the fruit can be grown, has it been a common item on U. S. menus. U.S.D.A. researchers at Pasadena, California, several years ago developed a guacamole base, which can be successfully frozen and stored. Further work by the Southern Utilization Research Branch, New Orleans, has resulted in determining effective packaging methods and two varieties of the fruit best suited for commercial freezing.

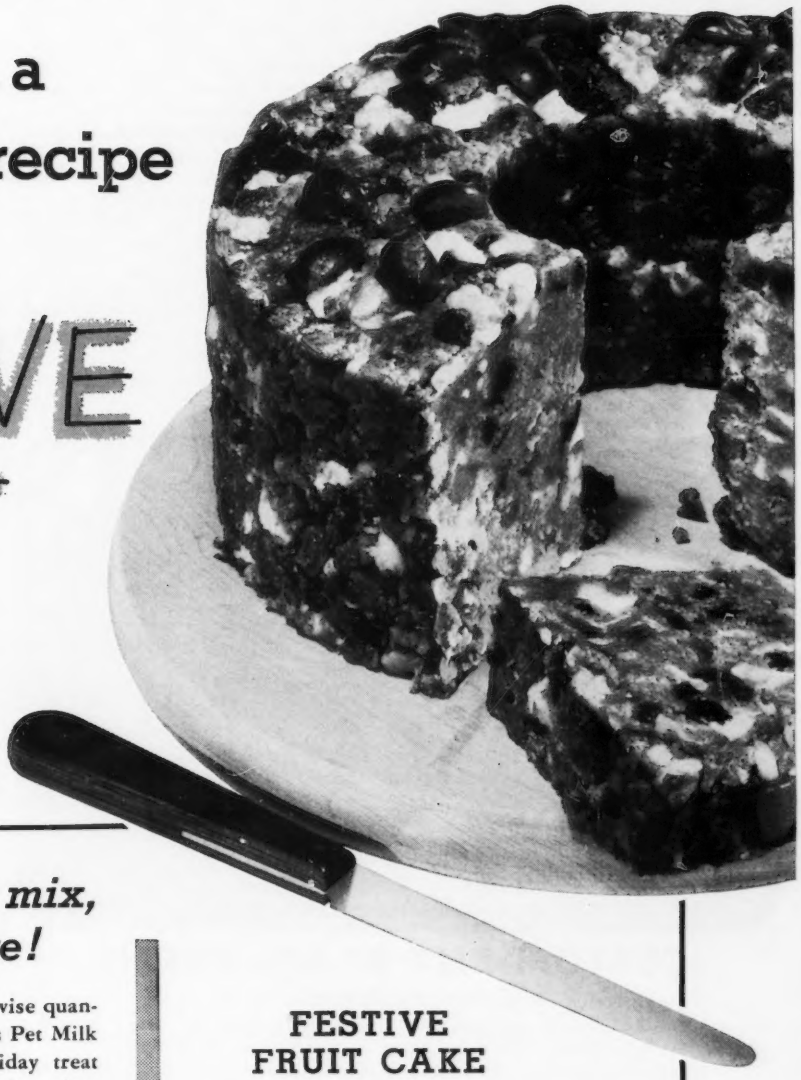
Additional research at the University of Miami in Florida has resulted in another frozen avocado product, "avocado whip," which is a puréed combination of avocado, onion, lime juice, salad dressing, and salt. As yet, these products have not been put on the market, but their impending availability would indicate a wider market for growers, as well as a new and tasty frozen food for consumers.

Frozen Fresh Cranberries. To widen the seasonal market for fresh cranberries, studies of acceptance of frozen fresh cranberries were conducted in Minneapolis-St. Paul area last spring. About nine out of ten customers who bought 1-lb. packages at 25 cents each were completely satisfied with them, and of these, 95 per cent said they would like to be able to buy this frozen fruit again in the spring and summer. Almost half of the women reported that they liked the frozen cranberries as well as the fresh; another 40 per cent said they liked them better; and 87 per cent preferred them to the canned products. Because fresh berries may lose as much as one-third of their moisture in storage, the frozen fresh berries generally contain more moisture, and if used for jelly, less water needs to be used. Although canned cranberries are on sale in several forms throughout the year, sales of fresh cranberries are usually limited to the period from September through January. It is hoped that production of frozen fresh berries for sale when fresh berries are out of season will widen the marketing period.

Tree Nuts. Estimates from the U.S.D.A. of nut crops for this year indicate that of the four important tree nuts—almonds, pecans, walnuts, and filberts—supplies will be about 5 per cent larger than last year and 8 per cent above average. Almond and pecan crops are larger than a year ago, but there are fewer walnuts and an extremely light crop of filberts—only a third of last year's supply.

Long range prospects for tree nut consumption also indicate increased crops and use. By 1975, it is estimated that population increase alone will

NOW... a 50-serving recipe for FESTIVE FRUIT CAKE



No baking—just mix, chill, slice, serve!

Ideal for you who plan and supervise quantity food preparation, this famous Pet Milk recipe makes a traditional holiday treat possible with less preparation time, less work, than ever before!

Festive Fruit Cake is *fail-proof*—even novices in your kitchen can make it with perfect success.

It's *delicious*—dark, rich, moist, with all the wonderful flavor of old-time fruit cakes.

It's *easy to slice and serve*—stays firm, doesn't crumble, allows exact portion control.

And the "success secret" is Pet Evaporated Milk . . . the *double-rich* milk that binds the mixture together, blends with other ingredients to give Festive Fruit Cake its perfect texture and mellow-rich flavor. No other form of milk makes Festive Fruit Cake like this . . . yet Pet Milk costs less, generally, than any other form of milk.

FESTIVE FRUIT CAKE
(FOR 50)

- 2 cups Pet Evaporated Milk
- 1 pound Marshmallows, finely cut
- ¾ cup Orange Juice*
- 3 pounds Graham Crackers, rolled into fine crumbs
- 1 teaspoon Cinnamon
- 1 teaspoon Nutmeg
- ½ teaspoon Cloves
- 1 quart dark or golden seedless Raisins
- 2 cups finely cut Dates
- 3 cups broken English Walnuts
- 3 cups ready-mixed cut-up Candied Fruit, bulk or canned**

Line bottoms and sides of four 5-cup loaf or tube pans with waxed paper. Put Pet Milk, marshmallows, and orange juice into a large bowl and let stand until needed. Put graham crackers, cinnamon, nutmeg, cloves, raisins, dates, walnuts and candied fruit into mixer bowl. Add milk mixture and mix at low speed until crumbs are moistened. Press mixture firmly into pans. If desired, garnish with candied fruit and nuts. Cover tightly. Chill 2 days before slicing. Keep in cool place. Makes 9 pounds.

*Alcoholic flavoring can replace the orange juice if desired.

**You can replace the 3 cups ready-mixed candied fruit with 1⅓ cups finely cut candied pineapple, 1⅓ cups finely cut candied cherries, and ½ cup finely cut candied orange peel.

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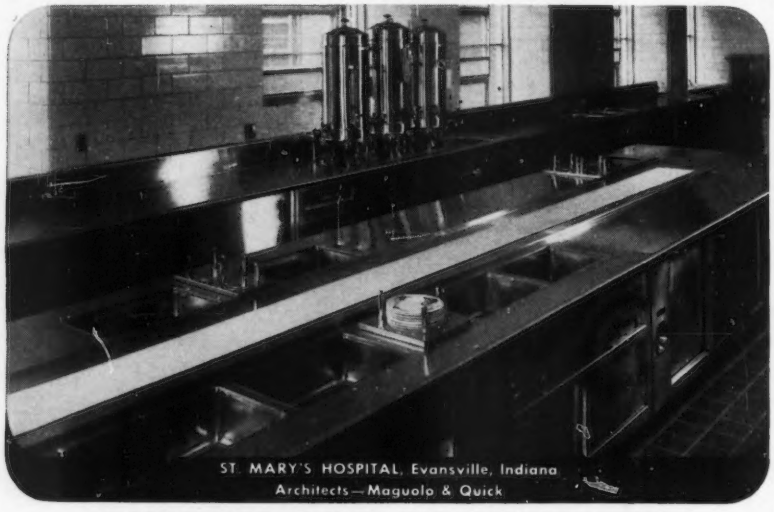
assure an annual consumption of 300 million lb. shelled nuts. Average consumption per person will be up, too, due to new methods of keeping nut kernels fresh, attractive, and convenient for food shoppers. Increased use is expected first in the baking and ice cream industries and in retail stores selling for home use. Greatest increase, however, is likely to be in the confectionery and salting industries which even today use the bulk of these nuts.

New Tomato for Tomato Paste. Horticulturists at the California Experiment Station have developed a new variety of tomato, the Roma, especially for use in making tomato paste. Prior to World War II, most tomato paste was imported from Italy, where the special tomatoes needed were grown. Then California growers tried to cultivate Italian tomatoes and U. S. processors began canning the paste. However, the Italian tomatoes were not resistant to wilt and growers often lost heavily in their crop investments. The new Roma promises to lick the wilt problem. It was developed by using two popular red Italian paste tomato varieties and the Pan America tomato. Through research, it has been possible to fuse in the new variety the characteristics needed, and predictions are that by next spring, sufficient quantities of seed will be ready for commercial dealers to meet growers' demands.



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News of State Associations

Georgia Dietetic Association. The Georgia Dietetic Association held its annual fall meeting on November 2 in Atlanta. During the morning session, groups met for discussions on: problems concerning individual participation in the association; promotion of dietetics as a profession, and dietary operations in small hospitals. The luncheon speaker, Gen. Alvan C. Gillem, Jr., of the National Foundation for Infantile Paralysis, addressed the group on "Leadership." In the afternoon, Dr. Leonora Mirone, Head, Department of Foods and Nutrition, University of Georgia, spoke on "Nutrition Advances," and Mary Anna G. Knox discussed "What Is Our Public Relations Rating?"

Illinois Dietetic Association. Officers for 1956–57 for the *Chicago Dietetic Association* are: President, Henriette D. Gebert, Passavant Hospital; President-Elect, Stella Wuerffel, Michael Reese Hospital; Secretary, Edna Aschenbrener, VA Research Hospital; and Treasurer, Sharon Hieronymus, Evanston Hospital.

Kansas Dietetic Association. The *Wichita Dietetic Association* has chosen the following as officers for 1956–57: President, Alice Johansen, West High School Cafeteria; President-Elect, Sister Martina Fehringer, St. Francis Hospital; and Secretary - Treasurer, Maureen Ummel, Wesley Hospital.

Mississippi Dietetic Association. On November 9 and 10, the Mississippi Dietetic Association met in Jackson. The program featured a talk on "Vitamin B_{12} and Folic Acid" by Dr. Warren N. Bell, Associate Professor of Medicine and Director of Laboratories, Medical Center, University of Mississippi.

The Mississippi Association has set aside money to provide for three $100 scholarships for Mississippi students taking dietetic internships. One of these is to be awarded to a Negro student.

Missouri Dietetic Association. On November 2, the Missouri Dietetic Association met in St. Louis. After a morning coffee hour, Lillian Mowry, Chairman of the Missouri delegates, reported on the A.D.A. convention in Milwaukee. Her discussion was followed by a talk by J. D. Sykes, Vice-President, Ralston Purina Company, St. Louis, whose title was "Above Par?" In the afternoon, "As Your Administrator Sees You" was the topic discussed by E. DeVeaux, General Office Manager, Ralston Purina Company, and John Warner, Associate Director, Firmin Desloge Hospital, St. Louis. "Do You Rate?" was the provocative talk by Dr. Amos Snider, Adult Education Division, University of Missouri. Other areas covered in the program included discussions of "Our Place in the Community" and "Know Your Diet Therapy."

St. Louis dietitians are participating in the national A.D.A. project on "Con-

Meat...

and the Protein Needs of the Post-Surgical Patient

With the passing of the catabolic phase following major surgery adequate intake of protein, calories, and vitamins is imperative for supporting the ensuing anabolic phase.[1, 2]

Only when the dietary protein supplies all the essential amino acids simultaneously—in sufficient amounts and in physiologic proportions—can the body effectively synthesize new tissue in the repair of wounds, or replace protein losses associated with surgical procedures.[3] For this reason the protein of meat, which provides a pattern of amino acids similar to that of human protein, is conducive to tissue reconstruction and protein repletion during surgical convalescence.

Meat supplies large amounts of high quality protein effective in promoting tissue anabolism. It also furnishes valuable amounts of B vitamins and essential minerals—iron, potassium, phosphorus, and magnesium. Bland soft diets, moderate residue diets, and low fat diets recommended for the postsurgical patient all include lean meat in two of the daily meals.[4]

1. Crandon, J. H.: Nutrition in Surgical Patients, J.A.M.A. *158*:264 (May 28) 1955.
2. Elman, R.: Protein Needs in Surgical Patients, J. Am. Dietet. A. *32*:524 (June) 1956.
3. Flinn, L. B.; Goodhart, R. S.; Kaye, R.; Mackie, J. A., and Ravdin, R. G.: Vitamins and Other Nutrition Factors in Clinical Practice; a Panel Discussion, Delaware M. J. *28*:51 (Mar.) 1956.
4. Ravdin, I. S., and Zintel, H. A.: Nutrition in the Care of the Surgical Patient, in Wohl, M. G., and Goodhart, R. S.: Modern Nutrition in Health and Disease—Dietotherapy, Philadelphia, Lea & Febiger, 1955, p. 857.

The nutritional statements made in this advertisement have been reviewed by the Council on Foods and Nutrition of the American Medical Association and found consistent with current authoritative medical opinion.

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tinuing Education for Dietitians." A seminar course, consisting of ten 2-hr. sessions on nutrition, is being given this fall under the guidance of Dr. Robert E. Shank, Head, Department of Medicine and Public Health, Washington University. The course will include discussion of the basic nutrients and human requirements for them, practical application of present knowledge of nutrition, and problems related to this application. A bibliography from which readings are assigned has also been prepared.

Montana Dietetic Association. The fall meeting of the Montana Dietetic Association took place at Montana State College, Bozeman, on October 26 and 27. A feature of the program was a session on "Know Montana Better," which included discussions of the legal aspects of feeding the public, the nutrition of the Indians, and dental health in Montana.

Officers for 1956–57 for Montana are: President, Gladys Roehm, Montana State College, Bozeman; President-Elect, Ruth Ann Boyd, Billings; Secretary, Marie Sopp, Billings; and Treasurer, Doris Dickinson, Butte.

Activities of the *Billings* dietetic group in the last year have included: providing a consultant to help in planning a church kitchen; distributing A.D.A. pamphlets on child feeding through the welcome-wagon hostess; lecturing on prenatal and postnatal care to mother's classes in a hospital; setting up a menu guide and outlining proper eating habits for the "Little League Baseball Team" when the team made out-of-town trips; addressing TOPS (Take Off Pounds Sensibly) Club; and talking on career guidance at the Billings high school.

Nebraska Dietetic Association. On November 1, the Nebraska Dietetic Association held its fall convention in Omaha. The first part of the program was devoted to discussions of "The Past" by Vesta Davis, who recapitulated the history of the Nebraska Association; "The Present" by Dr. Margaret A. Ohlson, State University of Iowa, Iowa City, who spotlighted progress on the national and international fronts in nutrition and dietetics; and "The Future," which was considered by Dr. Mary deGarmo Bryan, Chicago.

The afternoon meeting was comprised of a panel discussion on present progress in Nebraska, which covered the following topics: nutrition research, TV and radio, the shared dietitian, medical research, the Omaha Dietetic Manual, Camp Floyd Rogers for diabetic children, teaching nutrition on the college level, equipment, and commercial food production.

Oregon Dietetic Association. Portland was the site of the fall meeting of the Oregon Dietetic Association on November 2 and 3. The program included: "Home Economics in Thailand" by Dr. Margaret Fincke, Oregon State College, Corvallis; and "Work Simplification in the Institutional Kitchen," by Dr. Lendal H. Kotschevar, Montana State University, Missoula.

Reports of the 2nd International Congress of Dietetics and of the 39th Annual Meeting of A.D.A. in Milwaukee were given. Mary Ellen Johnson represented the national Association.

In the area of career guidance, the Oregon Dietetic Association was represented by its president, Ruth Mercer, at a "health careers" meeting on August 2. The purpose of this meeting, which was attended by representatives of some twenty organizations in the state which are concerned with health, was to explore locally the possibility of making a coordinated effort to recruit and interest young people in health careers.

South Dakota Dietetic Association. The Diet Therapy Section of the South Dakota Dietetic Association has completed "A Low Calorie Diet Booklet" which is based on the exchange plan. The 8 by 5 in., ten-page booklet contains brief explanations of the reasons for the diet, foods to be included each day, a form for "Your Meal Plan," the exchange lists, and a few recipes and notes on food preparation. This is the first of a series of instruction booklets on various modified diets to be prepared for use with nutrition clinic patients.

West Virginia Dietetic Association. The fall convention of the West Virginia Dietetic Association was held

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in Huntington on October 26 and 27. The program included the following talks:

"Implications of Atomic Medicine in the Field of Dietetics"—Dr. George Lyon, VA Hospital, Huntington
"What Is a Dietitian?"—Mildred Bonnell, University of Illinois, Urbana
"Administrative-Dietary Cooperation in the Organization and Function of the Dietary Department"—D. M. Brown, Administrator, Cavell Huntington Hospital

New officers of the West Virginia Association for 1956–57 are: President, Mary Boyles Shafer, Charleston; President-Elect, Margaret Gibbons Smith, Charleston General Hospital, Charleston; and Treasurer, Mary Jane Couture, Parkersburg.

Wyoming Dietetic Association. During the summer, the Wyoming Dietetic Association issued the first number of its new bulletin, "Range Rider," a four-page mimeographed newsletter.

Association Activities

A.D.A. Annual Meeting. The 39th Annual Meeting set a new record of attendance with 3976 persons. There were 270 booths, the largest number ever.

The 40th Annual Meeting will be held in Miami, Florida, October 22 to 25, 1957. Do start planning your vacation early. Perhaps your state of local dietetic association would be interested in seeing the 15 min., 16 mm. movie in color concerning Miami as a convention city. Further details will be sent to state bulletin editors.

New Emblem Available. In the November 1956 issue of the JOURNAL, page 1134, an announcement is made of our new emblems with the seal of The American Dietetic Association. Many of you will be interested in obtaining these from Headquarters office to wear on your uniform sleeve or blouse pocket.

Code of Ethics. The "Code of Ethics" has been reprinted in a more attractive form. The smaller size, measuring 7¾ by 9 in., is printed in gray lettering on embossed light cardboard and is available from Headquarters office at a cost of 5 cents each. The enlargement has retained exact original style, that of black lettering on parchment and measures 16 by 20 in.—very attractive for framing. The cost is 25 cents each.

***Journal* Reprints.** The special Association Report "Tools for Evaluating the Hospital Department of Dietetics" was published as "Suggested Standards" and "Check Sheet" in the October 1956 issue of the JOURNAL. Members are encouraged to make use of this aid in evaluation. Reprints are available at 10 cents each from Headquarters office.

"Supplements to Diabetic Diet Materials" by Elizabeth K. Caso, which appeared in the October 1956 issue of the JOURNAL are available in reprint form for 15 cents each from Headquarters office. The three new "Meal Plans," with sample menus No. 7, 8, and 9, and the revised "Diabetic Diet Card for Physicians," which has information on selection of a dietary prescription, may be obtained for 5 cents each.

State Meetings. A.D.A. representatives in October and November attended meetings of the following state dietetic associations:

October 24–26—Lucille Refshauge and Ruth Yakel, Florida Dietetic Association, Jacksonville
October 25 and 26—Bertha Biltz, North Carolina Dietetic Association, Charlotte
October 26 and 27—Mildred Bonnell, West Virginia Dietetic Association, Huntington
October 29—Dr. Doris Johnson, New Jersey Dietetic Association, Orange
November 1—Dr. Margaret A. Ohlson, Nebraska Dietetic Association, Omaha
November 2 and 3—Mary Ellen Johnson, Oregon Dietetic Association, Portland
November 2 and 3—Dr. Helen Hunscher, South Carolina Dietetic Association, Columbia
November 3—Marguerite L. Pettee, Kansas Dietetic Association, El Dorado
November 7 and 8—Winifred H. Erickson, South Dakota Dietetic Association, Sioux Falls
November 8–10—Dr. E. Neige Todhunter, Louisiana Dietetic Association, Shreveport
November 9 and 10—Ruth Dickie, Mississippi Dietetic Association, Jackson
November 16 and 17—Mary Ellen Johnson, Arizona Dietetic Association, Phoenix

Obituary

Emily Rose Rea. The A.D.A. office has been notified of the death of Emily Rose Rea on October 8. Mrs. Rea was a dietitian serving with the Veterans Administration in its hospitals in Ft. Logan, Colorado, and Spokane, Washington, prior to her marriage to Dr. Stanley Rea, pathologist at the VA Hospital, Spokane. She had been a member of the Association since 1950.

Norvelle A. Somerville. Word has been received by A.D.A. of the death of Norvelle A. Somerville of Chicago. Prior to moving to Chicago, she had been on the staff of Provident Hospital, Baltimore. She had been a member of the Association since 1945.

Helen Olson. Notification has been received by A.D.A. of the death of Helen Olson on September 13, 1956, in Neenah, Wisconsin. Miss Olson has been a member of the Association since 1941, and had been on the staffs of Swedish Hospital, Seattle, and of the University of Chicago Clinics.

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The following abbreviations indicate the source of material indexed: "ab," abstract under Current Literature; "br," Book Reviews; "cc" Current Comment; "ed," Editorial; "f," filler "l" Letters to the Editor; and "nn," News Notes. An asterisk indicates an original article in this JOURNAL. Book Reviews appear in the subject index under the heading, "Book Reviews." The Author Index, which follows the subject index, includes only the names of the authors of original material appearing in this JOURNAL in full or abstracted in the editorial section or in fillers, and the authors and reviewers of books reviewed.

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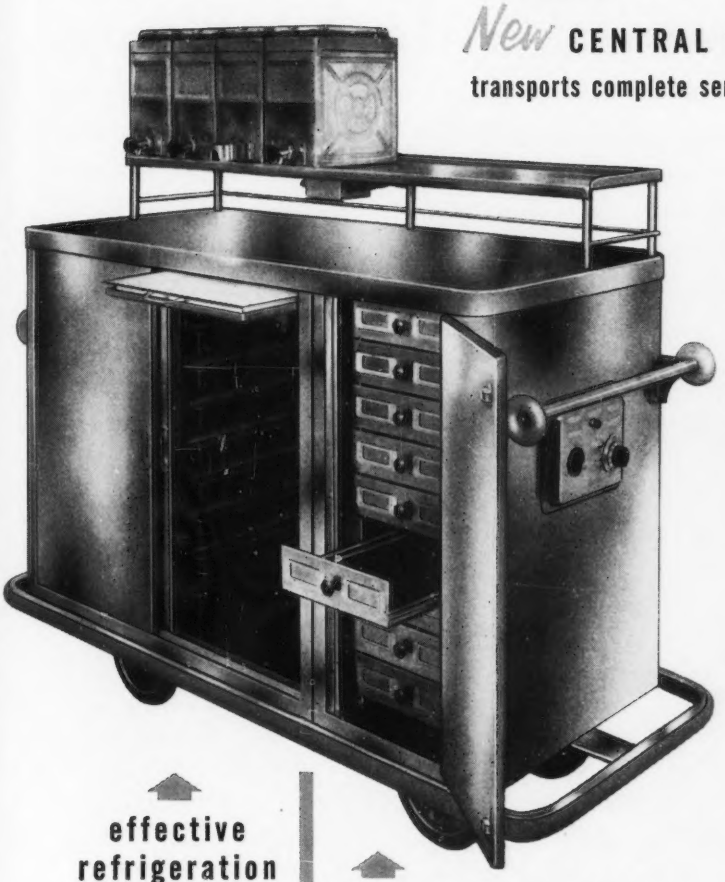
Young, C. M., *214, *218, *321, *429 l 842

Keep hot food hot...cold food cold!

New CENTRAL SERVICE TRAY CONVEYOR

transports complete servings direct from kitchen to patients



effective refrigeration here

controlled heat here

- Conveyor transports 18 complete servings of hot and cold foods, as well as beverages, trays, dishes and flatware. Truck is divided into two main sections, one refrigerated, the other heated.
- Cold section holds 18 set-ups trays with cold foods and desserts. Ice cream and butter keep firm, salads stay crisp and fresh.
- Electrically-heated compartment has nine drawers, each containing two dinner plates with hot foods, and two bouillon cups. Uniform heating is assured by new type electric radiant energy heaters.
- Separate insulated containers provide hot and cold beverages. Tray assembly at the patient area is simple, merely requiring placing of hot foods and beverages on trays by dietary aides. Larger models serving 20, 22 and 24 persons are also available.
- The conveyor is fabricated of heavy-gauge stainless steel. It is easily maneuvered, will withstand rugged service, requires little maintenance and conforms to rigid sanitary standards.

This new conveyor, adaptable to many types of centralized food service systems, is described fully in our latest catalog T-5. Write for a copy. Shows complete line of food conveyors available for centralized and decentralized services.

Service is simple and quick

1. In kitchen: plug in conveyor for pre-heating.

2. Insert refrigerant cartridges in cold section.

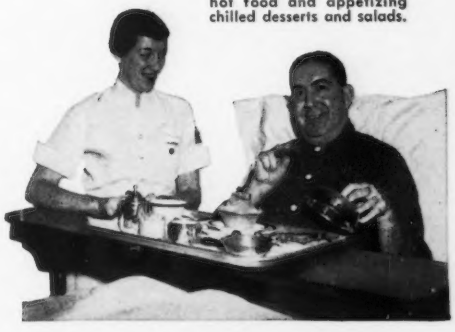
3. Insert set-up trays with cold foods.

4. Place hot foods in heated drawers.

5. At patient area, remove cold tray, pour beverages.

6. Take dinner plate from heated drawer and place on tray.

7. Serve patient with piping hot food and appetizing chilled desserts and salads.



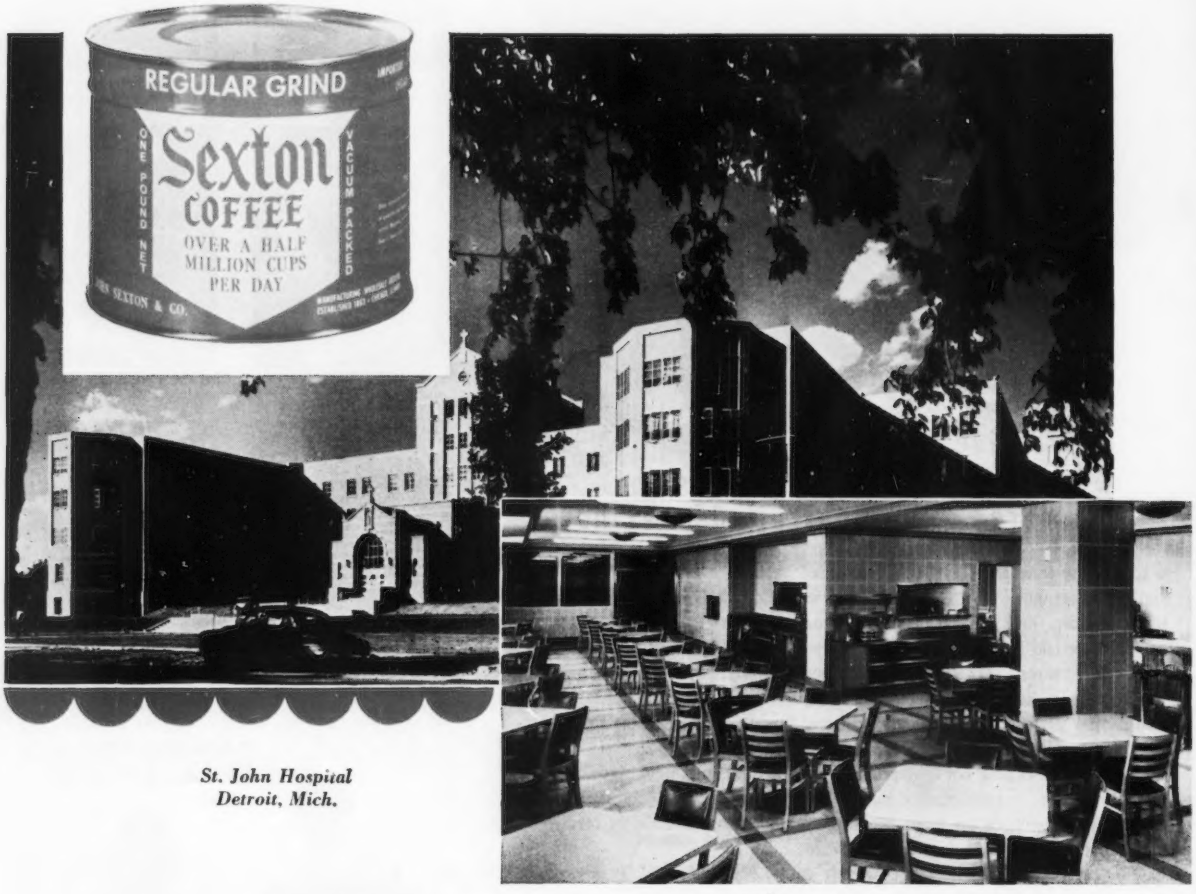
Blickman-Built

For Service Life Measured In Decades

S. BLICKMAN, INC., 4012 GREGORY AVENUE, WEEHAWKEN, N. J.

Custom blended for you

You can be sure of pleasing the most critical taste by serving Sherman Blend, the exquisite guest coffee. At a whiff of its distinctive aroma, the taste buds tingle. The first sip confirms it as something special. Appreciatively, your guest savors every drop of pure pleasure. Into this fine coffee, full-bodied and flavorful, has gone all we have learned of the art of blending and roasting in our nearly seventy-five years of specialized service.



St. John Hospital
Detroit, Mich.

Sexton
Quality Foods

JOHN SEXTON & CO., CHICAGO. 1956

A MILLION CANDLES CAN'T DO THE WORK

DONE BY ANY ONE OF THESE HOTPOINT SUPERline RANGES

— neither can any other fuel you have to "light"!

"POWER TO BURN" IS NOT THE SAME AS "POWER TO COOK"!

HERE'S WHY: In non-electric ranges, as much as 50% of the heat escapes through the flue or is otherwise wasted.

In a Hotpoint SUPERline range, up to 90% of the heat goes directly into the cooking top . . . does a cooking job. Electric ranges need no flues.

SUPERange Up to 42 Minutes Faster

Hotpoint engineers speed-tested 6 solid-top non-electric ranges against a SUPERange to compare the amount of time required to bring to a boil a 15-gallon stockpot of potatoes with water. The SUPERange was from 6 to 42 minutes faster than the others!

By actual test, the Hotpoint SUPERange showed a uniform temperature of 850°F. over the entire cooking top. Non-electric ranges averaged 850°F. only in the area directly over the burner—and averaged only 700°F. over the entire top (with some cooking areas so low that cooking was slowed almost to a halt)!

THAT'S WHY HOTPOINT ELECTRIC RANGE TOPS GET HOTTER . . . WORK FASTER . . . TURN OUT MORE PRODUCTION!

SUPERange (Model HRG7) (illustrated)

Any or *all* of the 3 independently-controlled 12″ x 24″ surface sections* can be converted from accurate, low-heat griddling to power-packed, high-heat hotplate work . . . at the turn of a dial! Exclusive Robotrol Thermostat means pinpoint 250°F.-850°F. temperature control!

**Also available with 2 griddle-hotplate sections and 2 French hotplates.*

SUPERhot-top (Model HRG17)

Pile on those heavy stockpots (holds up to 40-gallon capacity) and let this spacious, sturdy, speedy hot-top range go to work! Each of the three 12″ x 24″ heavy-duty hotplate sections is independently controlled by its own switch.

SUPERchief (Model HRG13)

Here's a 5-unit, multi-purpose range that lets you do fast "short order" work on the 2 Super Hi-Speed Calrod® Units up front . . . *and* heavy stockpot work on the remaining 3 French hotplates . . . *at the same time!* Cooking speed is phenomenal, on *both* types of surface units!

SUPERgrid (Model HRG14)

The range with the "griddle-top that can't be killed"—even under full capacity, refrigerated loads 'round the clock! *Four* griddles in one . . . separate heat dials accurately control each of 4 grid-top sections over a 200°F. to 450°F. range. Turns out 1050, 3¼″ hamburgers an hour!

SUPERoven

Variable bottom *and top* heat-balance controls assure perfect bake products. Pays for itself in meat shrinkage savings! Available with any SUPERline range.

Hotpoint ALL ELECTRIC Commercial Cooking

Hotpoint Co., a Division of General Electric Company

Mail Coupon TODAY!

HOTPOINT CO., Commercial Equipment Dept.
225 South Seely Avenue, Chicago 12, Illinois

_____Please send full facts on SUPERline Ranges.

_____Please send representative.

Name_____

Address_____

City_____County_____State_____

BOTH PHYSICIAN AND PATIENT

DEPEND ON YOU!

Solving the problem created by the high sodium content of the usual protein foods, Lonalac makes it possible for you to provide enjoyable diets adequate in biologically complete protein, yet low in sodium.

Lonalac is nutritionally similar to whole milk but contains almost no sodium—24 mg. per reliquefied quart, in contrast to the 480 mg. in a quart of milk. It serves as a major source of protein to supplement the limited amounts of meat and eggs permissible in a 200-400 mg. sodium regimen.

Reconstituted with water, Lonalac is used like milk . . . as a beverage, in double strength as cream, and in soups, white sauces, desserts and other appetizing dishes. It permits varied and taste-tempting meals that encourage patients to adhere to their low sodium diets for the extended periods often required.

Lonalac is virtually free of cholesterol.

Lonalac is available in 1 pound and economical 4 pound cans, specially priced to hospitals. Low sodium diet outlines are available on request.

LONALAC

THE LOW SODIUM, HIGH PROTEIN FOOD

MEAD JOHNSON & CO., EVANSVILLE, INDIANA, U. S. A. MEAD

to help you solve
many diet problems

Sustagen

therapeutic food for complete nourishment

A dilemma frequently confronting the dietitian arises from the fact that the nutritional needs of sick or injured patients are increased at a time when appetite and the ability to eat are often impaired. Further complicating the problem of diet in illness are physiologic disturbances which require the restriction of certain valuable nutrients—sodium, cholesterol, purines, etc.—common in many foods.

Type of Diet	Amount of Sustagen	Calories	Protein Gm.	Carbohydrate Gm.	Fat Gm.	Comment
Low purine diet	Sustagen, 530 Gm.	2050	124	350	19	no purine nitrogen; 42 mg. uric acid
Low cholesterol diet	Sustagen, 530 Gm.	2050	124	350	19	150 mg. cholesterol
High protein, low fat diet	Sustagen, 580 Gm.	2250	137	385	20	contains all amino acids in well balanced amounts
Liquid diet	Sustagen, 540 Gm.	2100	127	360	19	viscosity suitable for tube feeding
Bland diet (Peptic ulcer)	Sustagen, 570 Gm.	2200	134	377	20	buffering capacity of Sustagen is effective and prolonged
Liberalized low sodium diet*	Sustagen, 465 Gm.	1800	110	310	16	980 mg. sodium

*Note that the sodium content of Sustagen limits its use when dietary restriction of sodium must be severe.

Sustagen® is the only therapeutic food which contains all known dietary essentials, requiring only the addition of water. In addition to nutritional qualities Sustagen was designed to meet many physical and biochemical requirements of therapeutic nutrition. Thus Sustagen may be used, by mouth or by tube, as the only source of food or to fortify the therapeutic diet.

Sustagen is supplied in powder form in 1 pound, 2½ pound and 5 pound cans. One pound provides 1750 calories, including 105 Gm. protein.

MEAD

SYMBOL OF SERVICE IN MEDICINE

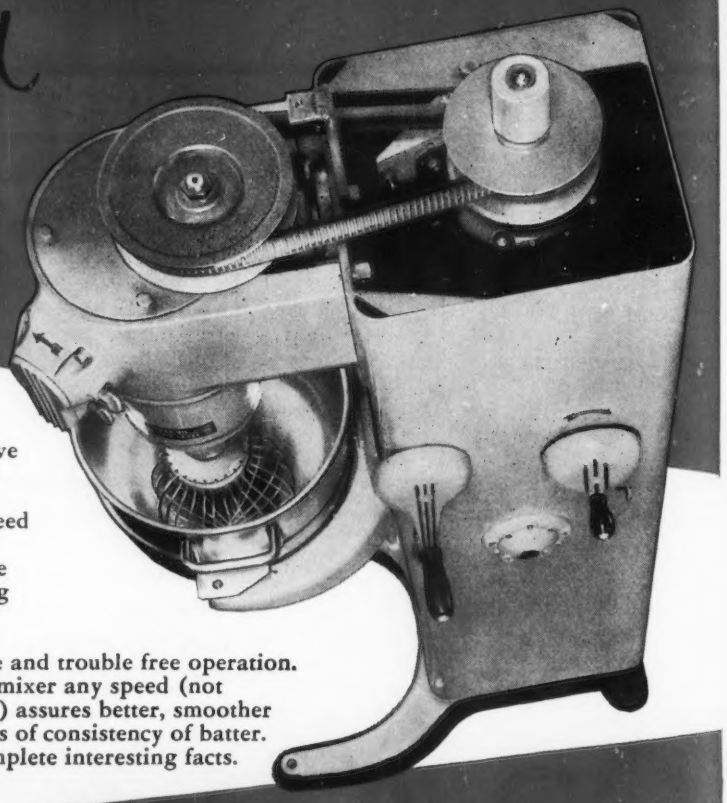
MEAD JOHNSON & COMPANY • EVANSVILLE 21, INDIANA, U.S.A.

as modern as TODAY'S
AUTOMATIC
TRANSMISSIONS

BLAKESLEE

Variable Speed
MIXERS
no gears to shift

ANY SPEED—NOT JUST 3 OR 4



Greater automaticity and engineered features to reduce wear and maintenance and operating costs is the goal of the automotive industry. Blakeslee, too, have followed this creed in developing more efficient kitchen machines for their customers. In the Blakeslee variable speed mixers, this principle is exemplified. Controlled mixing speeds are attainable without stopping the beater and shifting gears. The elimination of the stop and start strains in the Blakeslee mixers means longer life and trouble free operation. In the Blakeslee mixer any speed (not just three or four) assures better, smoother mixing regardless of consistency of batter. Write for the complete interesting facts.

Another Blakeslee innovation—the new slicer attachment that delivers vegetables directly into a plastic bag. Saves time and refrigerator space.

FOR THE BEST BUY BLAKESLEE

G. S. BLAKESLEE & CO.
1844 SO. LARAMIE AVE.
CHICAGO 50, ILLINOIS
NEW YORK • LOS ANGELES • TORONTO

How a good cup of coffee wins more compliments for the host

...more business for the house

Chase & Sanborn coffee is particularly enjoyable with a good meal. Its full-bodied, satisfying taste imparts a sense of well-being to your guests. And they'll remember that enjoyment the next time they decide to eat out.

Quick Quote from the Davis Brothers, operators of Davis Brothers Cafeterias of Atlanta, Georgia, who say, "We like to end all meals on a high note. That's why we are so careful about the coffee we serve. Chase & Sanborn Fancy Mark coffee has proven to be a fitting climax our guests remember."

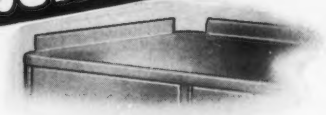
Call on Experience. Whatever your coffee problem may be, it's one worry you can safely turn over to your Chase & Sanborn representative. His storehouse of coffee "know-how" can help you serve the best cup in town. Call him today!

CHASE & SANBORN FANCY MARK COFFEE

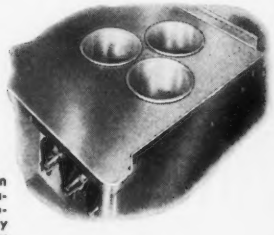
Watch for Chase & Sanborn's "SHE DESERVES TO EAT OUT—at Least Once a Week" advertising campaign in Time, Newsweek, The New Yorker, Holiday and Reader's Digest

NEW *Ideal* MEALMOBILE with... built-in BEVERAGE DISPENSER

Add speed and ease in your centralized food service system with this new unique Mealmobile. It delivers, with "kitchen-control," 20 meals of hot and cold foods . . . and dispenses both hot and cold liquids. The new Ideal Mealmobile is truly a new plus in food serving efficiency!



SEAMLESS TOP GUARD
Eliminates dirt catching crevices. Open corners permit easy cleaning. Extended edge of guard prevents articles carried on top deck from sliding off in transit.



BEVERAGE DISPENSER
Exclusive Ideal built-in beverage dispensers feature individual thermostatic control. Thoroughly insulated from each other and from the remainder of the cart, they can carry both hot and cold liquids. Each well has 5½ quart capacity.

LOCK SEAMED INSULATED DOORS
Exclusive Ideal overlapping doors provide positive seal regardless of temperature extremes. Easy to open and close. Glass fiber insulation reduces temperature change inside compartments.

SUPER SIZE DRAWERS
Seven heavy gauge aluminum drawers in the heated section. Each holds three 9" plates plus three side serving dishes. Safety stops and name card holders.

Model 9020B

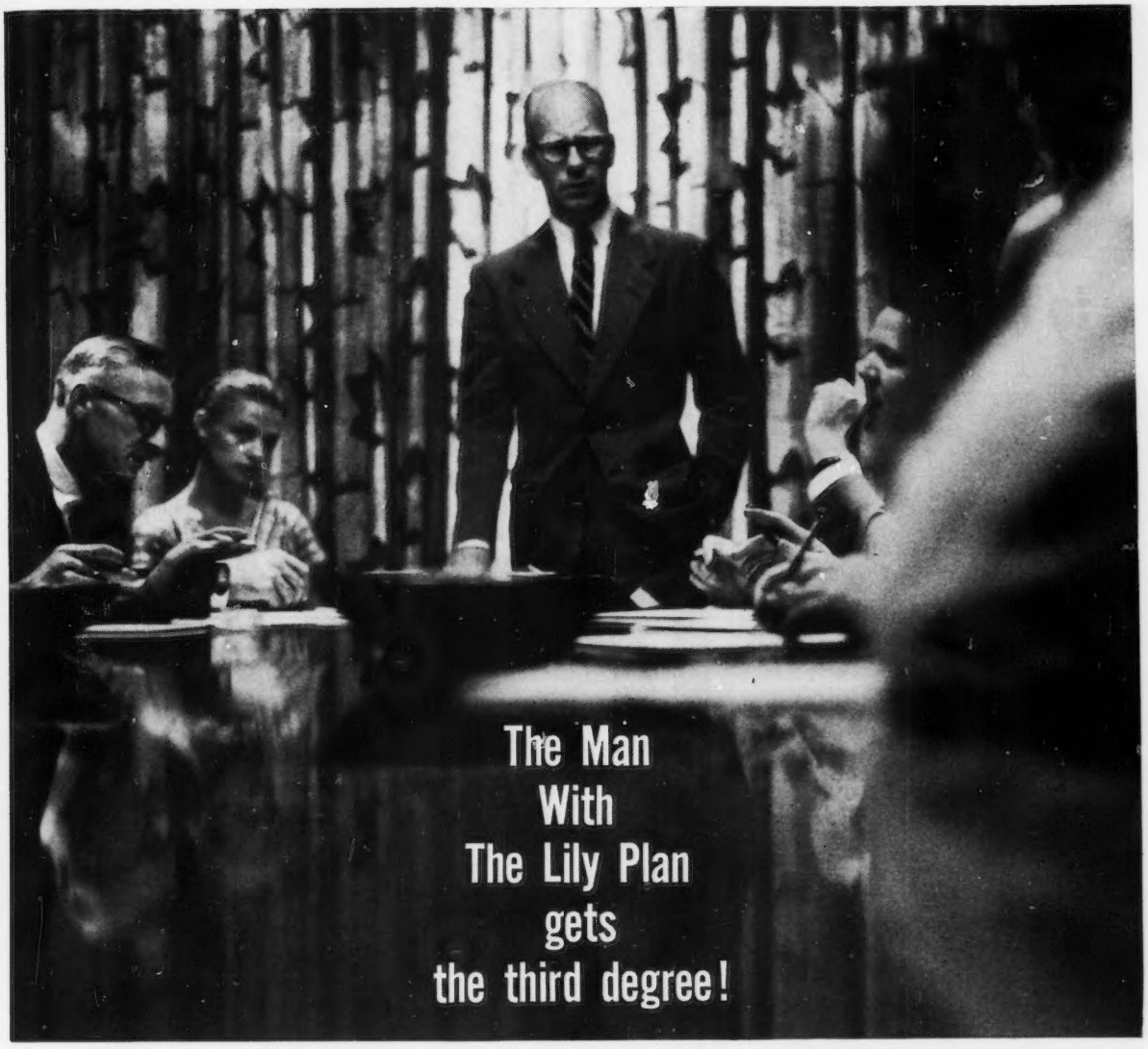
REMOVABLE TRAY GUIDES
Removable guides make entire interior easily accessible for cleaning. Guides can be scrubbed with pots and pans or run through dishwasher. Easy to clean and to keep clean.

NO-TIP TRAY GUIDES
Exclusive "no-tip" guides allow tray to be pulled out all the way and kept level for drawer-to-tray serving without lifting tray to top deck. Affords speedier service and less chance for error.

Write for FREE **CATALOG**

Ideal® HOSPITAL EQUIPMENT
Found in Foremost Hospitals

Made only by the
SWARTZBAUGH MANUFACTURING COMPANY
MURFREESBORO, TENN.



Result: Finer, faster service at less cost with sturdy, smart-looking Lily cups and dishes!

Class is now in session for The Man With The Lily* Plan and a typical group of food service experts. Certain to result; —a new insight for both on new ways to serve more people in less time . . . with less effort to staff, less cost to you!

Meetings of this type are typical of the kind of Lily thoroughness that produces a constantly expanding line that's winning acclaim from dieticians everywhere. Lily Cold Cups and pleated dishes, for example, are now an intricate part of food service in countless institutions. Staff finds they're easy to handle, lightweight, less fatiguing. Service is swift and effortless—cleanup time is cut to the bone. Management eliminates much costly washing, bussing and breakage. And by using the right cup and dish for the right food and drink, portions can be accurately controlled. Best of all, people like the sanitary service only paper can assure.

Cold Cups available: 3 oz to 24 oz; Dishes: 4 oz and 6 oz.

There's a lot to tell about Lily's time and money-saving innovations for all kinds of institutions. And whether you use paper service or not, it's well worth hearing. In fact, our Man With The Lily Plan has a special food service kit for your inspection, without obligation. He'll send it if you'll just send him a note. Write *Lily-Tulip Cup Corporation, Dept. JAD-12, 122 East 42nd St., New York 17, New York.*

*T. M. REG. U. S. PAT. OFF.

Kraft All Purpose Oil is steam-filtered to assure perfect results... no flavor transfer!

Steam-filtering is a process that sweeps foreign material from Kraft Oil with super-heated steam under vacuum . . . reducing to an absolute minimum impurities that cause flavor transfer and rapid breakdown. This careful processing helps assure you of a truly all purpose oil—a pure, bland, 100% cottonseed oil—that gives perfect results whether you're baking, frying, or making salad dressings.

No wonder Kraft Oil is the fastest climbing oil in national popularity.

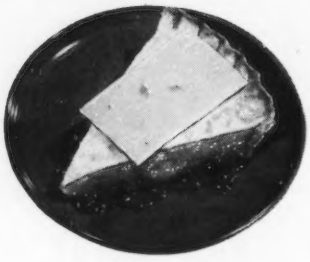
Steam-filtering helps make Kraft Oil the *perfect* oil for:

FRYING

Its high smoke point means longer frying life. And easy-pouring Kraft Oil develops perfect crusts on pan-fried or deep-fried foods . . . *without flavor transfer!*

SALADS

Kraft Oil has maximum stability—stays bland and delicate in flavor. It blends easily and instantly into other dressing ingredients to give deliciously smooth results!

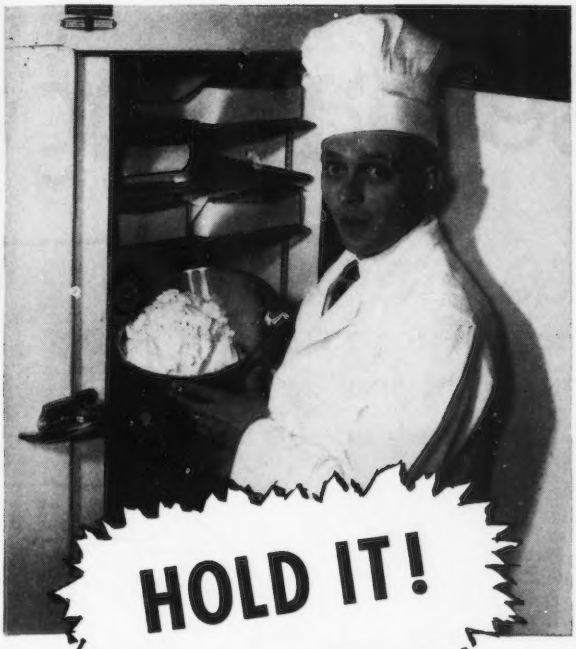


BAKING

Smooth, fast-blending Kraft Oil is simple to measure . . . *accurately*. It gives perfect baking results every time in any recipe that calls for liquid shortening.

The Nation's Taste is Your Best Buying Guide

KRAFT Foods Company INSTITUTIONAL DIVISION



HOLD IT!

That's YESTERDAY'S topping!

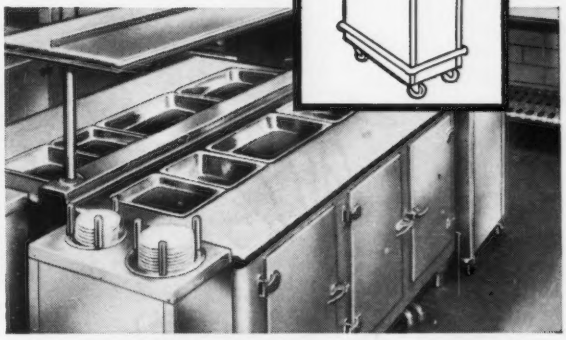
SURE it's yesterday's topping. But he'll use it today (and tomorrow, too, if there's any left)... usually with no need to rewhip it. That's because it's Rich's *Diamond Process* WHIP TOPPING...the amazing new dessert topping that's 100% stable up to 48 hours after whipping. It's *non-perishable,* too, and likely will save you 50% of your present topping cost. Ask your frozen food distributor, or write for descriptive folder.

Rich Products Corp., 1148 Niagara St., Buffalo 13, N. Y.

Rich's diamond process® WHIP TOPPING

AMF LOWERATOR* Dispensers —the planned, clean dish-handling system

Planned quantities of dishes, glasses and trays for efficient service-level dispensing... when needed, where needed— in mobile and in-counter models.



In many mass-feeding operations, mobile AMF Lowerator Dispensers are wheeled *where* they are wanted, *when* they are wanted. Planned quantities of dishes are loaded directly into units at the dishwasher and easily rolled to service points. Unnecessary re-handling and extra service labor are eliminated. Handling and breakage are minimized; smaller dish inventories can be more efficiently used.

Automatic, service-level dispensing and perfect positioning are combined in the AMF Lowerator Dispenser System. Designed in sizes and capacities to meet all requirements; available in mobile or in-counter, heated, unheated or refrigerated models. Mobile models make it easy to expand, since facilities are enlarged *without* costly remodeling.

Your Food Service Equipment Dealer will assist you in planning the AMF Lowerator Dispenser System best suited to your needs. See him or write for catalog illustrating the complete line of AMF Lowerator Dispensers.

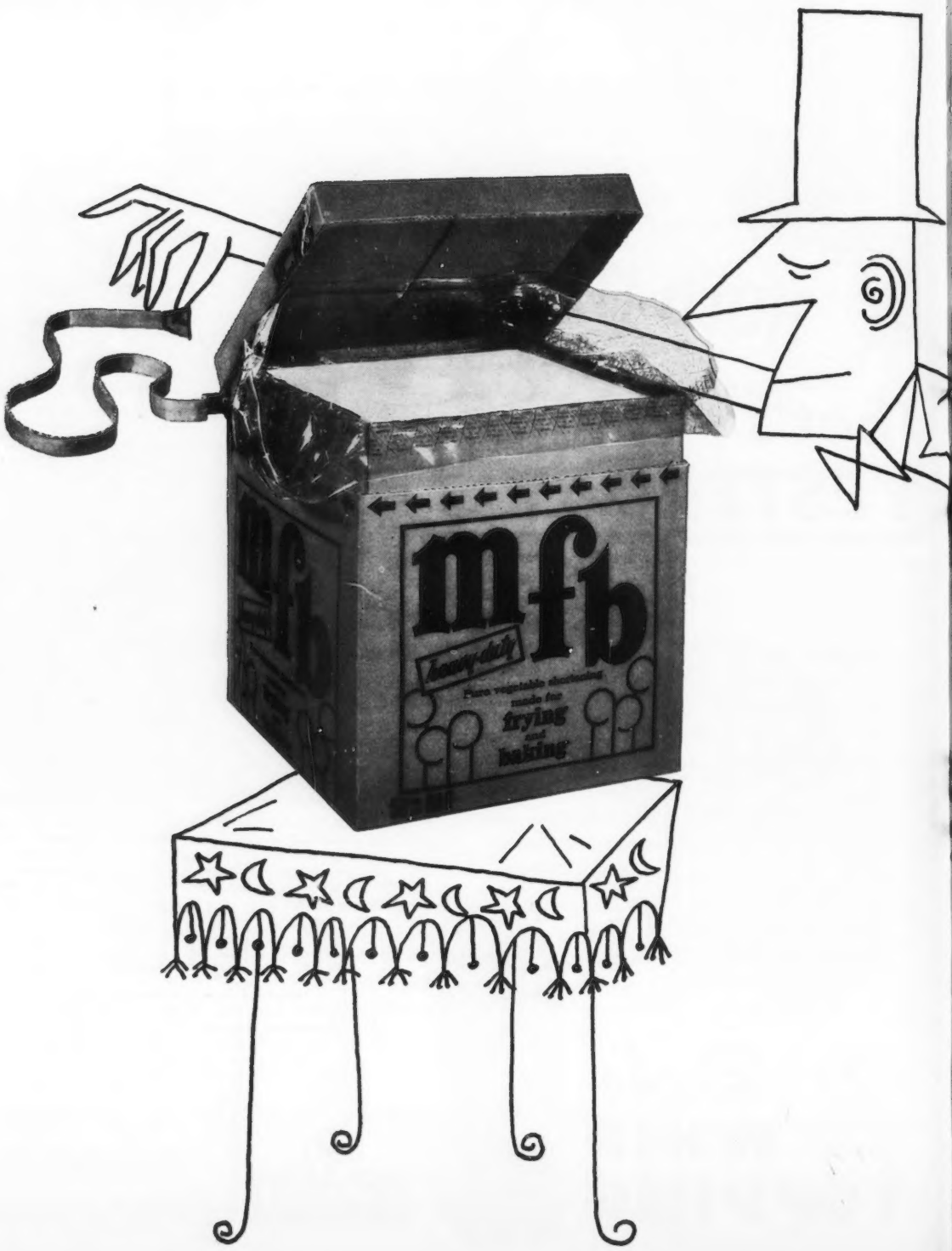
Another AMF Product

LOWERATOR SELF-LEVELING DISPENSERS

*LOWERATOR is the registered AMF trademark for self-leveling dispensers.

Lowerator Division
AMERICAN MACHINE & FOUNDRY COMPANY
AMF Building • 261 Madison Ave. • New York 16, N. Y.

Surprise package fr



...efrom HEAVY-DUTY MFB

New "Zip-open" 50-lb. carton* zips open in 6 seconds, then re-seals . . . leak-proof lining . . . double thickness of corrugated board . . . easy to handle.

*Patent applied for

HINGED TOP RE-SEALS TIGHT
Contents always fully protected. Can't lose top!

AND SO ECONOMICAL!
Heavy-Duty MFB in the new 50-lb. carton costs less per pound than in the 110-lb. can!

For frying, baking, always use Heavy-Duty MFB. It's the all-vegetable, all-hydrogenated shortening with the high smoke point. Order from your distributor salesman or Wesson representative today!

Shortening is no sideline with us . . .
that's why Heavy-Duty MFB can do so much so well!

The Wesson® Oil People
New Orleans, Louisiana

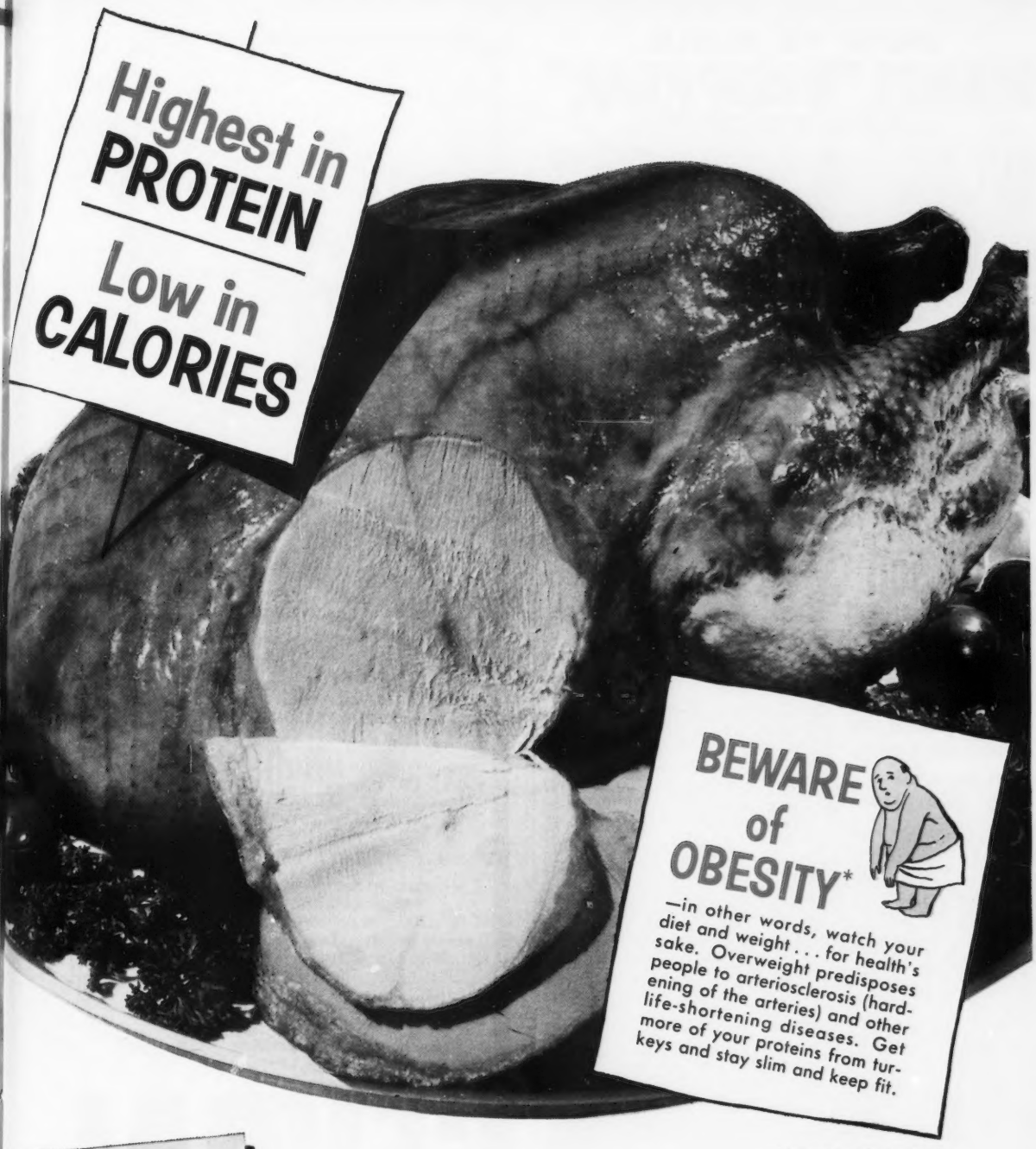
TURKEY is good... and so good for you ... economical, too!

Too often it is humorously remarked, "the things which are good are not good for you." With turkey, just the opposite is true. For turkey meat is both highest in protein and very low in calories—as recent tests made by Cornell University clearly prove. So turkey is both good and good for you.

Here's how Dr. Milton L. Scott, director of the 1955-56 Cornell protein-fat-vitamin studies puts it:

"Research in nutrition over the past decade has shown that the average American needs to reduce his caloric intake so as to prevent overweight, and in addition to this he needs to make certain that a large portion of his food consists of high-quality protein. Excessive fatness shortens life and limits its usefulness and enjoyment. This research with men and animals indicates that by consuming a higher protein diet and cutting back on our calories we will be eating all of the protein and vitamin nutrients needed for growth and repair of wear and tear in our tissues without consuming excessive amounts of calories which can only be converted to fat.

"In recent studies at Cornell University we have shown that all of the animal meats are high in protein but that turkey stands out above all the rest. The turkey is highest in protein and low in calories. Turkey is also higher in the important B vitamins, such as niacin and riboflavin. These results show, therefore, that from a nutritional point of view we cannot go wrong in making turkey meat an important part of our diet."


Highest in
PROTEIN
Low in
CALORIES
BEWARE
of
OBESITY*
—in other words, watch your diet and weight . . . for health's sake. Overweight predisposes people to arteriosclerosis (hardening of the arteries) and other life-shortening diseases. Get more of your proteins from turkeys and stay slim and keep fit.

* Very fat or fleshy—Webster.

Use coupon to order **FREE BOOK OF FACTS "Turkey . . . Highest in Protein . . . Low in Fat"**

NATIONAL TURKEY FEDERATION
Mount Morris, Illinois

Please send me.....copies of new booklet, "Turkey, Highest in Protein—Low in Fat." Single copies free; additional copies 5c each.

Name.....

Address.....

Firm.....

City.....**State**.....

(Distribution limited to Continental United States)

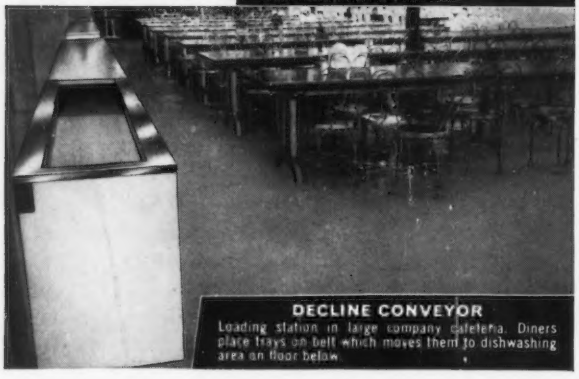
HOW TO MAKE
DISHES "DISAPPEAR"
AT A PROFIT

INCLINED CONVEYOR
Loading station of Olson Inclined Conveyor. Soiled dishes are moved up and overhead, out of the way, en route to dishwashing room.

Use an **OLSON** *Conveyor System*

- Save labor...save time
- Reduce dish breakage
- Cut overall food handling costs

SUBVEYOR
Trays are loaded on an Olson Subveyor for delivery to central dishwashing room in basement. Subveyor moves dishes up or down.



DECLINE CONVEYOR
Loading station in large company cafeteria. Diners place trays on belt which moves them to dishwashing area on floor below.

When you want to move dishes quickly, quietly and at lowest cost, move them on an Olson Dish Conveyor. There's an Olson Conveyor to handle any requirement—moving dishes up, down or horizontally . . . in trays, boxes or individually. With an Olson Conveyor, you can reduce your labor force, handle greater volume in less space, improve employee morale and cut food service costs considerably. We are specialists in reducing dish handling costs, with many years of experience in the design, manufacture and installation of mechanized dish handling equipment in every type of food service establishment and institution.

Write for the location of the nearest Olson installation to you. See for yourself what mechanized dish handling is doing for others. Ask for Catalog on Olson Dish Conveying equipment.

OLSON CONVEYORS
SERVING AMERICAN INDUSTRY SINCE 1900
Samuel Olson Mfg. Co., Inc.
2424 Bloomingdale Ave.
Chicago 47, Illinois
Offices in Principal Cities

TUBE-FEEDING FORMULA

quick! easy! complete!

To prepare, mix
1 quart whole milk
3 cups (405 Gm.)
non-fat milk powder
4 heaping tablespoons
(60 Gm.) **GEVRAL PROTEIN**
Add water to make
2,000 cc.

REFRIGERATE UNTIL READY TO USE

This formula supplies essential nutrients for 24 hours:

Liquid.....	2,000 cc.
Protein.....	217 Gm.
Fat.....	42 Gm.
Carbohydrate..	273 Gm.
Calories.....	2,354

plus 26 vitamins and minerals

Lederle

GEVRAL* PROTEIN

GERIATRIC VITAMIN-MINERAL-PROTEIN SUPPLEMENT

LEDERLE LABORATORIES DIVISION *AMERICAN CYANAMID COMPANY*
PEARL RIVER, NEW YORK

*REG. U.S. PAT. OFF.

EVERY GRAIN

Guaranteed fluffy!

actually cooks itself fluffy!

. . . STAYS FLUFFY ALL THE WAY THROUGH AND IT'S WEEVIL PROOF

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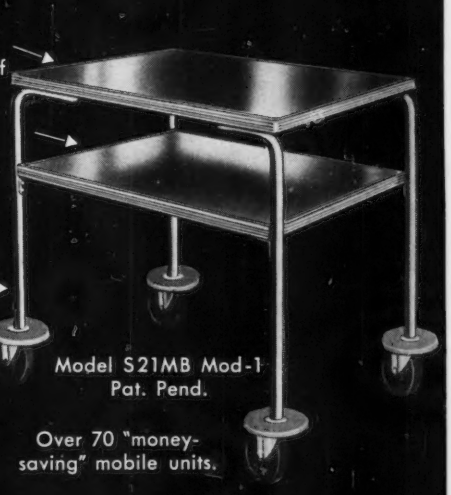
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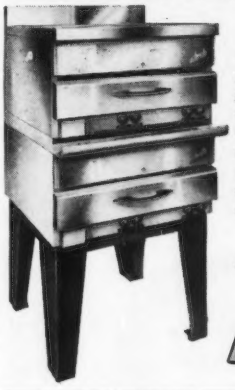

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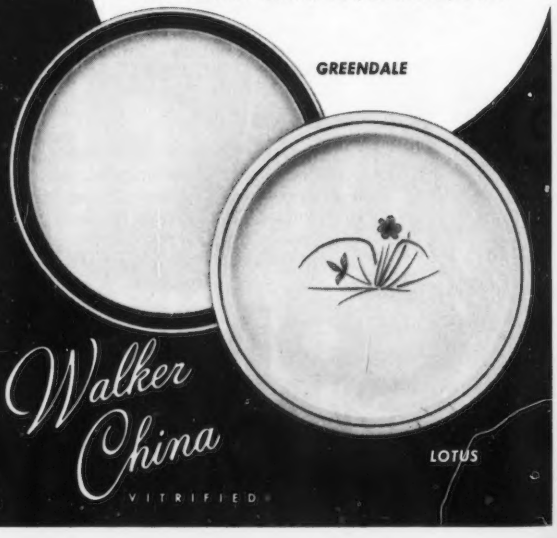

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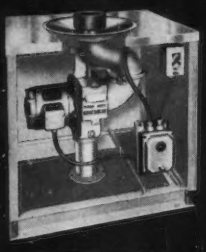

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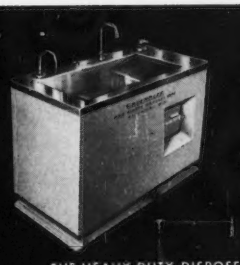

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Quaker Oats and Mother's Oats, the two brands of oatmeal offered by The Quaker Oats Company, are identical. Both brands are available in the Quick (cooks in one minute) and the Old-Fashioned varieties which are of equal nutrient value.

1. Watt, B.K., and Merrill, A.L.: Composition of Foods—Raw, Processed, Prepared—Washington, D.C., United States Department of Agriculture, Agricultural Handbook No. 8, 1950.

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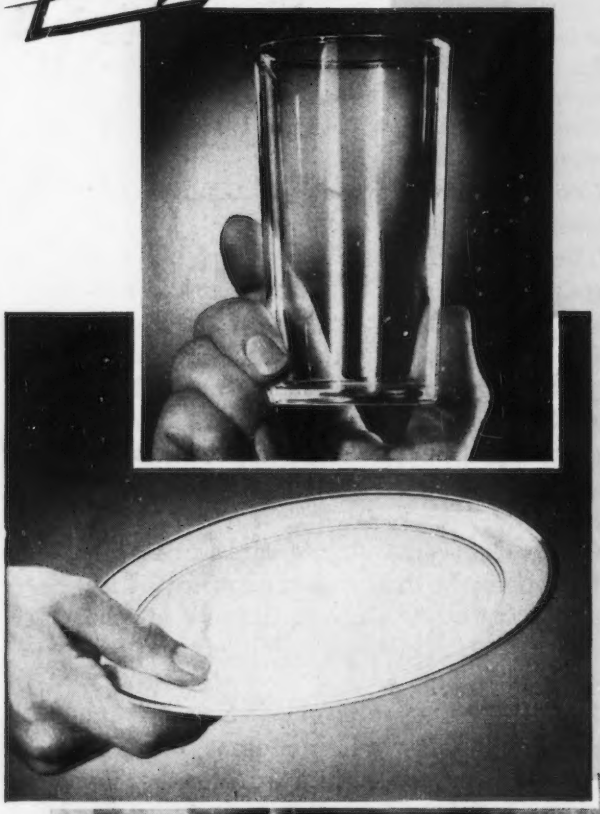

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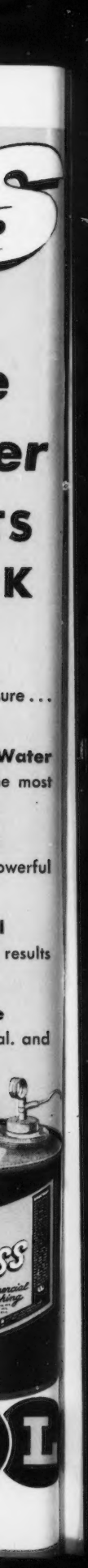
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